FRENCH CONCRETE SHIPS (Illus.). See p. 256.
NATIONAL INDUSTRIAL RESEARCH LABORATORIES. See p. 258.

SHIPBUILDING AND SHIPPING RECORD

A JOURNAL OF SHIPBUILDING, MARINE ENGINEERING, DOCKS, HARBOURS AND SHIPPING

LONDON: Queen Anne's Chambers, S.W. 1.
GLASGOW: 87, Union Street.
NEWCASTLE: Lloyds Bank Chambers.

THURSDAY, MARCH 7, 1918.

Price Sixpence Weekly.
Prepaid Subscription for 12 months:—
Inland, £1 5s. 0d.; Abroad, £1 12s 0d.

The DELTA METAL Co., Ltd., East Greenwich, London, S.E.10. Sole Manufacturers of:—
DELTA METALS: BRONZE, BRASS, COPPER, NAVAL BRASS, YELLOW METAL, WHITE BRASS, BABBITS, Etc.
Forgings, Castings, Stampings, Rods, Sheets, Wire, Tubes, Etc.
FOREMOST since 1883.

THE YORKSHIRE COPPER WORKS, LTD., LEEDS. TUBES BRASS and COPPER. "BEMAL" BRASS CONDENSER TUBES.

WM. McGEOCH & CO. LTD.
FOR
Ships' Brassware, Lamps & Electric Fittings
GLASGOW, BIRMINGHAM, LONDON & NEWCASTLE.

THE "STONE" SYSTEM
OF
HYDRAULICALLY OPERATED WATERTIGHT DOORS.
As fitted to latest Mail and Passenger Steamers.
J. STONE & Co., Ltd., Deptford, London, S.E.8.

STEWARTS AND LLOYDS, LTD.
GLASGOW · BIRMINGHAM · LONDON
IRON AND STEEL TUBES
MAIN STEAM PIPES
STEEL CASTINGS
SHIP & BOILER PLATES
TUBULAR DAVITS, DERRICKS, ETC.

JOHN I. THORNYCROFT & Co., Limited.
SHIPBUILDERS & ENGINEERS
MARINE MOTORS & MOTOR BOATS.
CAXTON HOUSE, WESTMINSTER, LONDON, S.W. 1.
ALL TYPES OF STEAM, COMMERCIAL and PLEASURE CRAFT.

THE SUNDERLAND FORGE & ENGINEERING Co., LTD.,
SUNDERLAND.
ELECTRIC LIGHT & POWER FOR SHIPS. - - ELECTRIC WINCHES.

SHIPBUILDERS J. C. & H. SHIP REPAIRERS
CRICHTON
Co. Ltd. Ltd.
CHESTER. LIVERPOOL.

BILLINGTON & NEWTON LTD
TRADE MARK
PHOSPHOR BRONZE, BABBITTS, KINGSTON'S AND MAGNOLIA
TRADE MARK
TIN AND COPPER NAMO. PLASTIC ANTIFRICTION METALS
LONGPORT STAFFORDSHIRE

Alphabetical Index of Advertisers, Page 46.

1 w.

Classified Index to Advertisements, Page 41.

BRIGGS'

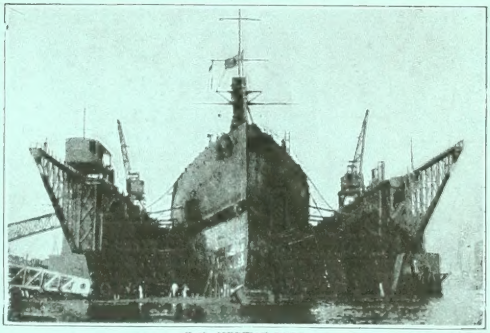
BITUMINOUS

ENAMELS & SOLUTIONS

HAVE BEEN APPLIED TO

**THE TWO LARGEST FLOATING DOCKS,
THE FOUR LARGEST VESSELS, AND
THE TWO BIGGEST BRIDGES**

IN THE WORLD.



H.M. MEDWAY DOCK.

W. BRIGGS & SONS, Ld. DUNDEE & LONDON.

United States Agency: BRIGG'S BITUMINOUS COMPOSITION CO. (Inc.), 17, Battery Place, New York.

SPECIFY AND INSIST ON GETTING

BRIGGS'

**THE WORLD'S RECORD
ANTI-CORROSIVES.**

SHIPBUILDING AND SHIPPING RECORD
A JOURNAL OF SHIPBUILDING, MARINE ENGINEERING, DOCKS, HARBOURS AND SHIPPING

Published Every Thursday at
QUEEN ANNE'S CHAMBERS, WESTMINSTER, LONDON, S.W.1.
Branch Offices—
Glasgow: 87, Union Street. Newcastle: Lloyd's Bank Chambers.
New York: Woolworth Building.

Telegraphic Address: "Recordship, Vic., London."
Telephone No.: 2247 Victoria.

Subscription, including regular weekly and special issues, published from time to time, payable in advance and postage free:—

British Isles	£1 5s. 0d.
Elsewhere	£1 12s. 0d.
Single Copies	Sixpence.

The Editors will be glad to consider articles and paragraphs submitted by competent writers. All accepted contributions will be paid for. Whilst every care will be taken to return unsuitable articles, photographs and drawings (when a stamped addressed envelope is enclosed for that purpose) the Editors cannot hold themselves responsible for the safekeeping of unsolicited contributions.

Vol. XI.] Thursday, March 7, 1918. [No. 10.

CONTENTS.

EDITORIALS:
Sir E. Geddes' Statement ... 249
U.K. Shipbuilding ... 249
Mr. Barnes and the Shipyards ... 249
Wages and Output ... 249
Lloyd's Claims Bureau ... 250
Insuring Profit on Sale ... 250
Convoy and War Risks ... 250
Underwriting Fleets of Steamers ... 250
Germany and Scandinavia ... 250
Argentine's Shipping Tax ... 251
Australian Wheat Shipment ... 251
A Contract for Lifeboats ... 251
Industrial Research ... 251
Internal Combustion Engines ... 251
Shipbuilding in the United States ... 252
The Norwegian Shipbuilding Contracts ... 252
The Influence of Engineering on the Design of Ships ... 253
Publications Received ... 254

ILLUSTRATED:
French Concrete Ships ... 256
Submersible Motors ... 261

MISCELLANEOUS:
Cardiff Shipbrokers and New Scale of Charges ... 254
Cardiff and Bristol Channel Shipowners' Association ... 255
The Life of the Sea ... 256
A National Industrial Research Laboratory ... 258
Special Railway Facilities for Merchant Seamen ... 260
The Imperial Merchant Service Guild ... 263

STEAMSHIP APPLIANCES:
The Thermo-Electric Pyrometer 264

GENERAL NEWS SECTION ... 265

SHIP SALES ... 275

SHARE TABLE ... 276

SIR ERIC GEDDES, the First Lord of the Admiralty, made a review of shipping questions in the House of Commons on Tuesday. The speech was well balanced and certainly it faced squarely some of the difficulties which have arisen. He dealt with the disappointing output of new mercantile tonnage in January, and no doubt his anticipation that the output of February is likely to be nearly twice that of January affords some measure of relief. But even that will only be two-thirds of what the same yards and fewer men have done in a month. It is, indeed, an extremely unsatisfactory state of things when the First Lord can say at a time of crisis like this that "the men in the yards are not working as if the life of the country depended on their exertions." Sir Eric makes it clear that only by the steadfast co-operation of all can the losses inflicted on our shipping be overtaken. The submarine in his opinion is still held, but not yet mastered. It is being destroyed in increasing numbers. In the North Sea, the North Atlantic and English Channel our measures seem to be most successful. "It would not be an unduly favourable estimate to say," remarks the First Lord, "that in recent months the chances against a submarine returning from its voyage in these waters are only about one in four or one in five." That indeed is encouraging, but the warning words which fell from Sir Eric's lips in regard to precautions on the part of merchant vessels in obscuring lights are worthy of most careful attention. We shall recur to his speech on a later occasion.

Sir E. Geddes' Statement.

Estimates of shipbuilding output are so rarely fulfilled that practical men are probably much less alarmed at the falling off in the tonnage of completed merchant ships than politicians and their newspapers appear to be. But there is not the least doubt that after making due allowance for the optimism of well-meaning but inexpert people, the United Kingdom's shipbuilding industry is at present doing less than, properly organised, it is capable of doing. Several causes of its comparative inefficiency have been cited by members of the Government who have, however, almost without exception, left the public to guess the exact degree in which each has contributed to the undesirable total, effect. The conclusion of the average man that the workers are a good deal to blame for the falling-off is probably sound. There are, of course, extenuating circumstances. The weather in winter is seldom favourable to outdoor work. A great many of the men are, moreover, tired. But there have been stoppages over differences which could easily have been adjusted while work proceeded, and time has been lost by pieceworkers which there was absolutely no need to lose. Many of the workers do not seem to realise that in their fight against the German submarines the naval authorities are heavily depending upon producers of merchant ships. Yet it is easily ascertainable that they are; they also quite clearly believe that the more the shipyards do, the sooner will the menace be mastered. The country looks to the shipyard workers to pull themselves together, and hopes that it does not look in vain.

U.K. Shipbuilding.

It is scarcely surprising after the serious statement made by Mr. Barnes that the shipbuilding output of February will not show much improvement on that of January, and further, that America is failing us in shipbuilding, that a sharp breath of criticism should have blown through the House of Commons on the following day. Labour ferment is partially at least responsible for the falling off. Mr. Bonar Law adds that a larger amount of repair work has been undertaken. It is easy enough when things go wrong to blame the Government. They have had their difficulties. As events are working out, it would, however, seem that for a certain amount of the disappointment in the public mind in the matter of shipbuilding they cannot altogether divest themselves of responsibility. Some of their forecasts have been pitched in too confident a tone. We deprecate, however, party polemical views of the situation, and we fervently hope that the appeal of Mr. Barnes to the shipyard workers will find the response which it deserves. Its frankness and seriousness were framed in a true spirit of patriotism. Mr. Bonar Law spoke of supplementing it with information which would let the men in the shipyards know how serious the real position is. Whether the situation will be represented to them in actual tonnage figures had not been decided when he spoke. At the same time it is manifest that the House of Commons is recognising the vital issues involved. Its duty, as was once said, is not so much to do things as to see that things are done.

Mr. Barnes and the Shipyards.

War workers who are at present doing very well indeed, in the matter of wages increases, make no secret of their intention to carry over, if possible, all the war period's abnormally high rates into the post-war period. Whether it is possible or impossible to do so obviously will depend upon whether the normal industry can stand the higher wages, and, so far, that is a question which few representative workers have had the courage or the candour publicly to discuss. No employer in shipbuilding or engineering objects to pay high wages provided there is a sufficient consideration in the shape of output. In the economy of both industries wages and output are closely related, although many workers either deny that they are or flatly decline to discuss the matter. Their line of reasoning apparently is that as wages have risen to their present

Wages and Output.

level independently of output there is no reason why output should ever again be a consideration. On its face, the argument is bad, and, if it is carried to its logical conclusion, the workers themselves will be the first to discover that it is. Industry must pay everybody concerned or go to the wall, and it cannot in the long run be remunerative to anybody if wages steadily rise and output remains stationary or declines. Workers are unwise in their own interest to ignore that. Sir James McKechnie put the matter in a nutshell the other evening when he said that workers were entitled to share increased prosperity. "But," he added, "their greater earnings must be associated with greater production."

Lloyd's Claims Bureau.

It is a natural sequence of events that Lloyd's underwriters should come to settle their claims *en bloc* through the medium of a Bureau. The success of the signing bureau, now nearly two years old, followed by the proved convenience of the Returns Bureau, which was the second venture of this nature, has led to the adoption of the same system for the settlement of claims, and it is understood that the scheme will soon be in operation at offices in Cornhill. A large number of underwriting syndicates have signified their intention of having their claims settled by the new method; and since Mr. A. C. Gordon, who has held an important post in the claims department of the Alliance Assurance Company, has been appointed to scrutinise claims presented for settlement, it is probable that there will be little to complain of, either on the part of the insurer or the assured. There is, nevertheless, a certain amount of opposition in the insurance market to the new departure. The grounds of this opposition seem to be based on the fact that claims may be passed which, in the usual course of business would be queried, if not disputed. There is little need for apprehension that such might be the case, however, and it is probable that the custom of following the settlement of leading underwriters, which is a general practice at Lloyd's, has led to just as many doubtful claims being passed under the old system as there will be mistakes under the new. It will be remembered that similar criticism was offered to the Signing Bureau scheme when first it was mooted, but where are its critics now?

Insuring Profit on Sale.

When writing last week on the subject of total loss insurances in excess of the 15 per cent. Disbursement Clause, we made it apparent that underwriters were determined to permit no deviation from the strict terms of this warranty. There is one instance, however, in which it is possible for an owner to insure his vessel on the total loss basis for an amount in excess of that permitted by the Clause. This occurs when a vessel has been sold, and delivery is to take place on her arrival at her destination. If, under these circumstances, the total amount recoverable under the insurance policies in the event of loss amounts in all to less than the amount to be received by the seller of the vessel, there is no objection to an insurance being placed on a total loss basis for the amount represented by the difference between the total existing insurances and the purchase price of the vessel. This interest is described in the policy as "Profit on sale," and the insurance is, of course, done on the "policy proof of interest" basis.

Convoy and War Risks.

Some speculation has taken place in America regarding the incidence of war risks and marine risks in accidents to steamers under convoy. Of course, a war risk arises out of a peril caused by the existence of a state of hostilities. If two vessels in a convoy collided in the darkness, owing to the fact that they were necessarily and properly steaming with obscured lights, the risk would be a war one. Even the Collision Regulations, which are so stringent in their insistence on the rules concerning lights, allow that due regard is to be given to special circumstances which may render a departure from them necessary in order to avoid immediate danger. The exhibition of lights in a war zone might simply be a beacon to a lurking submarine to do her deadly work. Thus the obscuring of lights may quite well be the precaution which prudent and careful navigation adopts in choosing the lesser to the greater danger. In our own courts we had a collision with a French warship in the Mediterranean construed as a war risk under some such circumstances. On the other hand, should a collision between two vessels in a convoy take place as the result of negligence on the part of one or the other in carrying out the ordinary rules of navigation, we take it that the war risk would not operate.

Underwriting Fleets of Steamers.

The custom of underwriting fleets of steamers, with a provision made in the contract for the acceptance of new or acquired steamers on the same terms as the other vessels of the fleet is coming under some criticism on the part of underwriters. At the time when it was possible to build a vessel to one's requirements, or to purchase a vessel suitable to one's trade, there was little to complain of, because owners were only too anxious to keep the standard of excellence in their fleets at the highest pitch. Now that the replacement of lost tonnage is becoming a matter of great difficulty, it frequently happens that an owner will purchase a steamer of a class which would not have satisfied his requirements in pre-war days. It is obvious that the addition of this vessel to the insurances of the fleet depreciates the standard of risk on which the underwriters estimated their original quotation. The difficulty does not apply so much to fleets where a separate rate is fixed for each vessel, since then the rate applied to the new purchase would be a matter of arrangement; but where a flat rate is paid to include all vessels under the management of one owner, it is obvious that the inclusion of a bad risk is likely to upset the calculations on which the fleet was originally written.

Germany and Scandinavia.

The extraordinary degree to which speculation has developed in Scandinavian shipping is one of the most remarkable features of the war, and it is interesting to note the instances which attract attention in enemy journals, and the explanations and comments given by the latter. In a recent review of the Scandinavian position, *Hansa* asserts that speculation has been carried so far that further increase can hardly occur in the price of Norwegian and Swedish shares. The price of these shares has fallen little since February, 1917, "despite the highly uncertain conditions for shipping." The foundation of new Norwegian owners was checked by the difficulty of securing fresh tonnage. Activity in founding new ownership has been least marked in Denmark, where also "the price of shares has kept comparatively low, or, at least, proportionate to business prospects." The considerable drop on Copenhagen exchange last spring was recovered but gradually during the summer and early autumn. *Hansa* attributes the rise in Danish prices at the end of September and early in October to the activity of Norwegian and Swedish speculators who "discovered that the price of Danish shares was lower than justified by the inner affairs of the companies." They, therefore, bought large blocks of shares and realised huge profits by manipulating sales and amalgamations, "not in the national interests or with a view to developing the concerns, but simply to realise immediate profits." The general scheme is, it is alleged, to secure that one firm of owners buys out another at a high figure corresponding to the present price of vessels. The seller makes a large profit, the buyer incurs a heavy financial burden, and the shares of both concerns soars—"according to plan." Such manipulations prejudice the sound development of the firms concerned. *Hansa* asserts that just as Swedish owners and syndicates have acquired a share majority in certain Danish shipping firms, so Norwegian speculators have acquired a share majority in the larger

Dutch firms, or, at least, sufficient influence to bring about a rapid rise in prices, and an instability of markets resulting in considerable financial loss to Dutch interests. The only remedy is prohibition of shares passing into foreign possession or control.

Argentine's Shipping Tax.

According to a cable received from Buenos Ayres by the Royal Mail Steam Packet Company, the Argentine Legislature has increased the charges on shipping as from February 1 last, so that they are now : Light dues, 14 cents ; sanitary dues, 2 cents ; entry dues, 30 cents ; and wharf and permanency dues, 3 dollars, per net registered ton. This decision is all the more surprising, as towards the end of last year a special parliamentary committee considerably modified the Budget proposals, and in fact, rejected the impost in question. Evidently, however, other counsels have prevailed since; yet, as it is estimated that the increase will not yield more than £1,000,000, it is somewhat difficult to understand why the Government refused to respond favourably to the representations on the subject made by our Foreign Office on behalf of British shipowners, whose capital investments have done so much to develop the trade and commerce of that country, and to raise its wealth and prosperity to its present high level. As a war measure, the advance may, of course, be justified by necessity, notwithstanding the comparatively small amount that is in aggregate expected from it, but viewed in the light of Argentine's tonnage requirements, it certainly does not seem to be very wise policy. Moreover, seeing that negotiations for the purchase of 2,500,000 tons of Argentine wheat for the Allies were recently concluded, it looks as if the South American authorities were really trying to take undue advantage of the situation.

Australian Wheat Shipment.

An enormous quantity of wheat—something like 6,000,000 tons, it is estimated—is now awaiting shipment to Europe at the various ports in the Commonwealth and inland centres, with no immediate prospect, it is feared, of removal. Apparently, in order to overcome as far as possible the food shortage here, the British authorities are, owing to the much shorter distances involved, arranging to give a preference to grain from the Americas. In fact, as we indicated last week, the New Zealand Prime Minister has addressed a protest to the Shipping Controller against the transfer of several vessels from the Australasian to the Argentine routes, although in this connection it may be as well to state that there is no truth in a report that the steamers recently acquired by the Commonwealth Government have been engaged in running to and from South America, instead of being used for the purpose intended, namely the transport of Australian wheat to this country. Meanwhile, however, there is a serious risk of deterioration in the case of grain stored in the Commonwealth, chiefly to the insect pest, though it is satisfactory to learn that the Federal Government is doing its best to prevent the damage from spreading. In almost all the States new silos are being erected on the most modern methods, and more efficient supervision of the stocks is also exercised. Moreover, the Wheat Commission has decided upon a more rigorous inspection of the grain prior to shipment.

A Contract for Lifeboats.

When contracts are varied or cancelled by word of mouth it is just as well that the purport of the arrangement should afterwards pass as a written communication. It prevents quite honest misapprehensions arising in the future. If this course had been followed between the parties in the case of Lambie *v.* The Cunard Steamship Company, Ltd., it is scarcely likely that Mr. Justice Bailhache would have had to review in court the circumstances attending a contract for the construction of a number of lifeboats. After the *Titanic* disaster there was a very proper rush on the part of steamship companies to increase their life-saving appliances, and the Cunard Company gave the plaintiff an order for 50 semi-collapsible lifeboats of a certain type in April, 1912. Two were delivered and paid for, but later on it became apparent that the Board of Trade was inclined to look with a disapproving eye on the particular type of boat. At the request of the Cunard Company work under the contract was suspended. Early in 1913 the Board issued new rules after which the company would clearly not desire any more of the boats. An interview between the parties took place, and according to the company the order was cancelled. The plaintiffs contended that it was not. The Judge came to the conclusion that it had been cancelled, but his suggestion that the plaintiff should be compensated for the material he had bought for the purposes of the contract was agreed to.

Industrial Research.

The problem of industrial research depends to a very large extent upon the provision of proper laboratory and experimental workshop facilities, where research can be carried out. In the National Physical Laboratory we possess an institution which, as Sir R. T. Glazebrook, the Director, said in a lecture at the Royal Institution last week (see page 258), will, in the future as in the past, endeavour to fulfil two functions : it will be a laboratory of industrial research, and a national testing institution or proving house. Among the eight different departments into which the laboratory is divided, there is, thanks to the generosity of Sir Alfred Yarrow, the National Tank, wherein experiments on hull forms, propeller shapes, &c., can be made. This department, and also the others, has its own superintendent, and a staff of scientific assistants and observers. Sir R. T. Glazebrook explained that the ultimate control of the laboratory has hitherto rested in all particulars with the Royal Society, who have been responsible for its finances. Really, it has been a private concern of the Royal Society, supported most cordially by six of the leading technical societies, and dependent for part of its income on a grant-in-aid from the Treasury. From April 1, however, its property, now invested in the Royal Society, will be invested in the Imperial Trust for the Encouragement of Scientific and Industrial Research. It is to be hoped that under the new ægis the sphere of usefulness of the National Physical Laboratory will be still further enlarged, and that, with the extension of its scope, shipowners will take fuller advantages of the National Tank.

Internal Combustion Engines.

In his paper to the members of the Newcastle branch of the Association of Draughtsmen, on "The Internal Combustion Engine," an abstract of which was published in our issue of February 14, Mr. Everett shows clearly in his comparison of the thermal efficiencies of the various types of modern heat engines, the great superiority of the Diesel engine. This superiority is almost wholly obtained by the high compression which it is possible to give to the air before admission and ignition of the fuel oil to the cylinders. As the author points out, compression is the chief characteristic of the internal combustion engine and is the essential foundation of all heat engine cycles. The Carnot cycle is the ideal one owing to its perfect efficiency, but cannot be strictly adhered to in practice, since the engine becomes too bulky and heavy even for very small powers. The author gives the weight of an engine of this type when working under the maximum pressure obtaining in the modern Diesel at about 17 tons per brake horse-power, whereas the modern engine only weighs at least one-hundredth of this figure. The original Diesel engine was intended to work on the ideal cycle, but was abandoned for the above reasons. The present working cycle although somewhat different from the ideal is still the nearest approach to it and hence its high state of perfection. The question as to the best ratio of compression to adopt in the various types was dealt with by the author and as was

pointed out the advantages of increased compression in the smaller engines are somewhat nullified by the loss of heat through the comparatively large cooling surfaces of cylinder heads.

SHIPBUILDING IN THE UNITED STATES.

THE statement made by Mr. Barnes—who is a member of the War Cabinet, and therefore in a position to know—that America was failing us as far as shipbuilding was concerned, whilst it has not brought forth any denials from the other side, has led to the publication of numerous reports of speeches by officials of the United States Shipping Board, in which a considerable degree of hope is expressed with regard to the future tonnage output. That the optimistic estimates which were made soon after the entry of the United States into the war have not been fulfilled is common knowledge, and we were never amongst those who believed that it would be possible for a production rate of 6,000,000 tons per annum to be achieved, at least not until a long time after the organisation of shipbuilding had been got properly under way. America has been compelled to face other problems than the mere organisation of shipyards, and it has been the failure to produce the necessary steel and the requisite amount of skilled labour to work it that has led to the actual output falling so far short of the estimate. Again, realising that by confining her attention to shipbuilding by the older methods in sea coast yards, it would be impossible to produce anything like the required amount of tonnage, attention was for a while fixed upon such doubtful expedients as wooden ships, composite ships and fabricated ships, all of which have led to the waste of large amounts of invaluable time, money and labour, and which, even in the long run, do not appear likely to yield any result commensurate with the efforts involved.

We have reported from time to time expressions of opinion from well-informed American sources, dealing with the failure of the wooden and the composite ships, and it must now be admitted that the "fabricated" ships are not being produced nearly as rapidly as was at first anticipated. According to our American contemporary *Shipping*, things are not going well with the "fabricated" ship plants built with Government funds. At Newark the plant of the Submarine Boat Corporation has been compelled practically to close down on account of the failure of railroads to move essential construction materials. Although the matter has been presented to the Director General of Railroads no remedy has yet been evolved by the railroad administration. Meantime the Government is paying thousands of men at this and other plants for idling. The present state of affairs is due to the failure of the railroads to move 1,000 cars of plates and shapes started from Pittsburgh for Newark. At Hog Island, where the plant is in charge of the American International Corporation, the situation is worse, and the Chairman of the Shipping Board has had to admit that the management of the Hog Island plant had not been what he expected it to be. He stated before a Committee of Congress that unless the yard was ready to build ships within a month some drastic steps would be taken by the Government. In view of this frank acknowledgment the Rules Committee decided that if the conditions at the Hog Island plant are not materially improved within a month, the House will direct a sweeping investigation into the matter.

This condition of affairs is no doubt due in some measure to the abnormally severe winter which has been experienced, and in time, with the return of more normal weather conditions, a more satisfactory report may be forthcoming. In confirmation of this a cablegram from the New York correspondent of *The Times* may be quoted. After announcing that a steel vessel of 8,800 tons was delivered to the Government after a trial test, and that another vessel of the same tonnage will be completed and delivered about March 20, three months ahead of programme, he states:—"Shipping Board officials who have recently been admitting that operations had not equalled expectations, are to-day once more in an optimistic mood as a result of the reports received from many quarters. Yards on the Atlantic Coast and the Gulf, now that spring has arrived, are speeding up work rapidly."

Finally, a public statement made by Mr. Hurley, the chairman of the Shipping Board, may be quoted, in which he gave some interesting figures relating to the American shipbuilding programme, which show convincingly that despite the failures of the past, America still hopes to be able to produce large amounts of merchant tonnage for the service of the Allied cause. "We have the shipyards practically completed," he said. "Materials will be in the yards very soon. I am now very optimistic as to the tonnage we shall produce this year. We have 130 shipyards, with 700 ways and 500,000 men, who should produce 1,600 ships. The winter has been the worst for many years, but our programme is now getting into its stride. During the month we expect to place in service 26 complete ships and launch 34 in addition. Seattle shipyard has already broken all records by launching an 8,000-ton steel ship in 64 days. The eastern shipyards are preparing to beat the Pacific Coast record."

It is to be hoped that these more optimistic forecasts will be fulfilled, and that together with our own the recent failure to maintain the tonnage output up to estimate may quickly be remedied.

THE NORWEGIAN SHIPBUILDING CONTRACTS.

IT will be within the recollection of our readers that a considerable amount of adverse criticism was levied against certain shipbuilders on the North East Coast when it was announced that they had booked up post-war contracts with Norwegian shipping firms for the construction of cargo vessels at rates which it was felt were such as to unduly prejudice the chances of British shipowners from replacing their lost tonnage at economical rates when the shipyards are again freed from Government control and when orders are accepted on a competitive basis. Criticism was, however, not only levied against the shipbuilders, who after all were only acting on business-like lines, but also against the Norwegian shipowners; it was felt in many quarters that they were taking advantage of the restrictions imposed upon British shipowners by the almost entire requisitioning of their fleets at Blue Book rates by the Government, and who were further handicapped by the operations of the excess profits tax, which effectually prevented them from building up reserves sufficiently large to pay inflated prices for new tonnage after the war. On the other hand it has been stated that Norwegian shipowners are not only free to take the fullest advantage of the high rates ruling at the present time, but further they are encouraged by a special relief from taxation to build up huge reserves for the purpose of the renewal of tonnage and the augmenting of their fleets after the war.

With a view to dispelling this adverse criticism, Mr. K. I. Knudsen, the ex-president of the Norwegian Chambers of Commerce, London, has written a long letter to *The Times*, in which he seeks to not only justify the action of the Norwegian shipowners, but also to show that they too are subjected to restrictions and taxation almost as intolerable as that borne by the British shipowner. After pointing out the existence of the "various mistaken ideas" with regard to these contracts, Mr. Knudsen proceeds to admit the hardship under which British shipowners are labouring and to admit that "no neutrals would quarrel with steps taken to protect British shipping after the war." On the other hand the Norwegian Chambers of Commerce feel that the part played by the Norwegian merchant seamen will certainly secure "most-favoured-nation" treatment for the Norwegian shipowners. The particular purport of the letter, however, is to dispel the idea that the Norwegian Government is subsidising shipbuilding. The shipowners have had to submit to special taxes not imposed upon any other industry, for in addition to the heavy municipal and State taxes and the excess profits tax, the Government imposed a tonnage tax, charging every shipowner

with a heavy duty per gross ton per month. Subsequently the Government decreed that when a steamer was lost, the difference between the book value and the insured value should be considered to be income subject to ordinary taxation, and it is this latest device of the Norwegian Government which will be suspended in cases where the insurance money is invested in new tonnage. In the opinion of the Norwegian Chambers of Commerce this cannot be considered a subsidy, "because not at any time has such a form of taxation of shipping been resorted to in Great Britain."

Dealing with the contracts themselves, Mr. Knudsen states that the contracts stipulate that the building of the steamers shall be commenced as soon as the British yards are allowed to fulfil private contracts. The vessels have received their yard numbers, which naturally conveys a certain guarantee. The Norwegian contracts stipulate for prices from £25 to £27 per ton deadweight, whereas the standard ships probably cost £18 to £20 per ton deadweight. The Norwegian contracts will thus, in the opinion of the Norwegian Chambers of Commerce, be likely to lead to financial loss in any case, but if the fulfilment of them has to be deferred for many years they will be ruinous.

The letter is on less debatable ground when it draws attention to the enormous losses sustained by the Norwegian mercantile marine during the war. Since the beginning of the war up to January 31 last, 710 steamers and sailing vessels, totalling 1,050,000 tons gross, were lost through acts of war, and 875 men have perished with them. In addition to this, 55 steamers and vessels have been posted as missing, with their officers and crew, numbering 700 men. Taking previous statistics as a basis, it may safely be said that more than half of these latter losses can be traced to the "spurlos versenkt" policy of Germany. In consequence of these very heavy losses, numerous officers and sailors are now unemployed. Norway has in the past suffered very much through emigration, and, naturally, she is anxious to prevent the loss of these men to the country. This is an additional reason why the Norwegian nation is so anxious that the mercantile marine shall be rebuilt. Further, the Norwegian Chambers of Commerce question why it should be considered contrary to British interests that these vessels should be built. The great need of the belligerent countries after the war will be to export as much as possible. Are not, then, steamers exports? The British yards were glad to have the Norwegian orders during years of depression, and we ask that it shall be considered whether it is wise deliberately to throw Norwegian owners into touch with the German yards, which will surely be very anxious to secure their orders. It need hardly be pointed out that, once they have acquired the habit of placing their orders in Germany it may be difficult to recapture them as customers.

With a great deal of what Mr. Knudsen says in his letter British shipowners do not disagree. Strictly speaking, when they objected to the acceptance of these orders by British shipbuilders, they were not sore over the fact that Norwegians were doing so well out of the war as the prices agreed upon indicated. Their grievance was that the British Government's financial policy prevented them paying the market price of post-war tonnage. Moreover, that is still their principal complaint, and they are waiting—not very patiently perhaps, but still waiting—to see how the Government proposes to remove the grounds of it. That the State will have to do something soon or late is certain, for, obviously, costs of construction being what they are, the State cannot, even if it owns and operates both the shipping and the shipbuilding industries, restore the mercantile marine without making heavy calls upon the Treasury. Whichever course it takes it must put back money which it ought never to have taken. Norwegians may safely disabuse their minds of the idea that anybody on this side of the North Sea desires to have unfair advantages over them. If we can beat them in fair competition for business we will not, of course, neglect to do so; but at the moment it really looks as if our opportunities to do so are, owing to the British Government's short-sighted financial policy, likely to be severely limited.

THE INFLUENCE OF ENGINEERING ON THE DESIGN OF SHIPS.

In 1899 Sir Philip Watts read a paper before the Institution of Naval Architects on "Elswick Cruisers" which showed the development in design which had taken place in the preceding years. Sir William White, during the discussion which followed the reading of the paper, made the following interesting remarks. "When considering cruiser designs generally, one cannot fail to be impressed by the enormous advantage which has resulted from the close association and joint working of the naval architect and the marine engineer. The key of progress in successive cruisers, and in all advances in speed, is to be found in that close association." These remarks apply with probably even greater force to-day than when they were uttered, almost 20 years ago.

One or two instances may be cited in which the requirements of the naval architect had outstripped the ability of the engineer to meet these. In the case of the *Great Eastern*, for example, whilst little or no fault can be found with the design, from the points of view of form and of structure, the power necessary to give the vessel a speed commensurate with her size and intended trade was beyond the possibilities of marine engineering at that time. The step taken was much beyond the natural tend of development, and the result was altogether unsatisfactory. Coming to later times, the last of the destroyers fitted with reciprocating machinery failed to achieve the speed for which they were designed. It appeared that the limit of attainment had been reached with this type of machinery and that it was impossible to design engines to develop more power on the given weight. Fortunately the introduction of turbine machinery came to the rescue and speeds which had been impossible of achievement with reciprocating engines were easily attained.

The success which attended the performances of the earlier destroyers of the turbine type led to the production of the *Swift*, which, like the *Great Eastern*, was too great an advance on preceding types. Subsequent evolution in design of hulls and especially in machinery has made possible the building of vessels of much higher speeds than that aimed at in the case of the above ship. It is certain that the limit of achievement has not yet been reached, although it is possible that in actual design of turbines the advance still possible is somewhat limited.

Comparisons of (1) the horse power developed per ton weight of machinery, and (2) the fuel consumption per horse power developed, in vessels of different decades illustrate the progress of marine engineering. In present day practice the horse power developed per ton weight of machinery varies from about 4 h.p. per ton to about 70 h.p. per ton, according to the type of ship being considered. If the maximum attained in the days of high speed reciprocating machinery be compared with that now reached in modern geared turbined destroyers the figures work out at about 40 h.p. per ton weight in the former and about 70 in the latter. Similarly in the question of fuel consumption, 1½ lb. of coal per i.h.p. per hour was considered good practice a few years ago, but the improvements which have been brought about enables a guarantee of fuel consumption of about 1·1 lb. per s.h.p. to be given.

Now the saving in weight of machinery which can be effected and the economy in fuel guaranteed enables the naval architect to devote additional space to the carriage of cargo in the case of merchant ships, or to greater offensive and defensive qualities in the case of ships of war. In some instances smaller dimensions can be adopted than was found necessary in former ships to fulfil similar conditions, as instanced in the *Normannia* and *Hantonia*.

Probably never before has the influence of engineering on the design of ships been more powerful than at the present time. So many different types of machinery may be installed that the shipowner is in difficulty as to which to adopt. The adoption of oil engines means a totally different ship from that which would

be built were reciprocating machinery installed, whilst geared turbines of the latest type would cause some modifications to be made in the most suitable design for a vessel with reciprocating machinery.

When the *Lusitania* and *Mauretania* were first proposed the question of the possibility of adopting only twin screws was raised. It was then decided that it was doubtful whether the production of shafts capable of transmitting the necessary power was possible. Accordingly the quadruple arrangement was adopted. Although this is very recent history still in the few years which have elapsed since then, engineers have found it possible to guarantee shafting which will transmit even greater power than that considered in a twin arrangement for the express Cunarders. The improvement in design of turbine machinery associated with gearing, together with the greater power possible to transmit through shafting of reasonable diameter, have made possible the design of large battle cruisers of about 200,000 s.h.p., and of speeds hitherto unattained.

Electric propulsion is still in its infancy, and its possibilities are practically unknown. It is not unlikely that this may lead in the future, and bring into being vessels of yet higher speeds and greater power.

Especially in fast vessels of considerable power, the design of hull and machinery showed receive the careful consideration of the naval architect and the engineer acting in unison, so that a well-balanced design may be attained and a successful ship produced.

PUBLICATIONS RECEIVED.

[A short notice of any publication does not necessarily preclude the subsequent appearance of a longer review.]

The Journal of the Institute of Metals. Vol. XVIII. Edited by G. Shaw Scott, M.Sc., London. The Institute of Metals, 36, Victoria Street, S.W.1. $8\frac{3}{4}$ in. $\times$ $5\frac{3}{4}$ in. $\times$ 1 in. Price, 21s. net.

The necessarily close relationship between war and metals, no doubt, accounts for the number and continued high level of the metallurgical papers published by the Institute of Metals. Every day there are being tackled and solved in the foundries and engineering shops, problems that, but for the war, might have been shelved for years. Much that is being done is of such a nature that it must necessarily remain unpublished until after the war, but, on the other hand, much of it can be safely and helpfully considered by technical and scientific bodies like the Institute of Metals, and published in the bound volumes of the Proceedings.

Marine engineers will be specially interested in Professor W. E. Dalby's lecture on "Researches made possible by the Autographic Load-extension Optical Indicator," a full and completely illustrated account of which is given in this volume. This lecture supplements the lecture given by the same author to the Institution of Naval Architects in 1917, wherein he considered the strength and inner structure of mild steel, and deals further with the subject introduced by Professor Dalby in 1912, in his paper on "Load Extension Diagrams obtained Photographically with an Automatic Self-contained Optical Load-Extension Indicator" (Trans., I.N.A., 1912).

The present volume also contains a continuation of the discussion on metal melting that was inaugurated by the Institute last year. A new system of gas firing is described, which is claimed to enable metals to be melted exceedingly economically, and which effects great savings in coal. The possibilities of using powdered coal for brass melting are fully discussed by numerous fuel experts. Though brass is so important for marine work, and so much space is devoted to its consideration in the Journal—notably in the case of Dr. Parker Haigh's article, "Experiments on the Fatigue of Brasses"—other of the non-ferrous metals and alloys that the Institute of Metals exists to study, receive attention. Thus, Professor H. C. H. Carpenter, who is to be this year's President of the Institute, contributes a valuable paper, jointly with Lieut. L. Taverner, on the effects of heat on aluminium sheet. Other metallurgical problems discussed relate to high temperature thermostats, and the effect of hydrostatic pressure on metals. A valuable treatise is given by Professor T. Turner, M.Sc., on "Hardness and Hardening," in which the latest views upon this subject are ably summarised and discussed.

The volume under review concludes with a section in which concise abstracts are given of all recent literature bearing on metals. This should be specially helpful to the busy man who has not time to digest all the technical and scientific journals.

CARDIFF SHIPBROKERS AND NEW SCALE OF CHARGES.

Mr. S. W. Hansen presided over a meeting of the Cardiff Institute of Shipbrokers (Incorporated), when he explained that the meeting was called for the purpose of dealing with the question of clearance fees. At a previous meeting the matter of chartering commission had been brought up. It appeared that a large number of steamers had been allocated to the management of owners in the United Kingdom. In the case of Newcastle boats being directed to load from the Bristol Channel, a broker was employed in the natural course of things, but that broker was not entitled to any commission at all; the only remuneration was the clearance fees and commission on bunkers. On this matter the committee had had an interview with Sir Ernest Glover, the Director of Shipping Management to the Ministry of Shipping. The Local Committee for the Supply of Coal to France and Italy had taken the matter up, and steps had been taken to approach the Ships' Licensing Committee to direct steamers to the Bristol Channel, but not to direct them to any particular firm. If they succeeded in this respect, Mr. Hansen said, the broker who had the handling of the business would then be directed by rota as to whom the boat would be allocated, and who would then be entitled to the commission of 1 per cent. A scale of clearance fees had been submitted by Middlesbro' which had met with the approval of the Shipping Controller, and on the basis of this scale Cardiff had had one drafted. These charges would not only apply during the war, but after the war, and would concern tonnage of every description. Mr. Hansen, in reply to a question, stated that the scale was intended to apply only to tramp steamers and not to liners. It was agreed that in the case of sailing vessels the charges be increased by 50 per cent., also, that the Shipping Controller be asked to instruct the Admiralty agents that the latter are not to take lower fees for owners' work. The scheme, with the foregoing riders, was unanimously adopted, and further matters of detail were left to the Committee.

Scale of Charges which the Executive Committee propose to Submit to the Ministry of Shipping for Approval.

Oversea Tramp Steamers for Bristol Channel Ports Arriving in Ballast and Loading Outwards.

	£	s.	d.
Steamers up to 500 tons d.w.	2	2	0
,, exceeding 500 tons up to 750 tons d.w.	2	12	6
,, ,, 750 ,, ,, 1,000 ,,	3	3	0
,, ,, 1,000 ,, ,, 1,500 ,,	3	13	6
,, ,, 1,500 ,, ,, 2,000 ,,	4	4	0
,, ,, 2,000 ,, ,, 3,000 ,,	5	5	0
,, ,, 3,000 ,, ,, 4,000 ,,	6	6	0
,, ,, 4,000 ,, ,, 5,000 ,,	7	7	0
,, ,, 5,000 ,, ,, 7,000 ,,	8	8	0
,, ,, 7,000 ,, ,, 10,000 ,,	10	10	0

Plus £2 2s. per 2,000 tons for vessels over 10,000 tons.

Oversea Tramp Steamers Discharging in Bristol Channel Ports.

The same Agency fees as above shall apply to all vessels discharging cargo (in addition to any outward fees) plus a bank commission at the rate of $\frac{1}{8}$ per cent. on the gross freight collected.

Example.—A steamer of 5,000 tons d.w. arriving to discharge cargo and afterwards loading outwards would pay £7 7s. agency plus $\frac{1}{8}$ per cent. on gross inward freight and also £7 7s. agency outwards.

Oversea Tramp Steamers arriving in Bristol Channel Ports for Bunkers only or taking Bunkers only after Discharging Inward Cargo.

	£	s.	d.
Steamers not exceeding 2,000 tons d.w.	3	3	0
,, exceeding 2,000 tons up to 3,000 tons d.w.	4	4	0
,, ,, 3,000 ,, ,, 4,000 ,,	5	5	0
,, ,, 4,000 ,, ,, 5,000 ,,	6	6	0
,, ,, 5,000 ,, ,, 7,000 ,,	7	7	0
,, ,, 7,000 ,, ,, 10,000 ,,	8	8	0

Plus £2 2s. per 2,000 tons for vessels over 10,000 tons.

The above scales shall not apply to liners or general cargo boats or to steamers calling for repairs, but the fees in such cases shall be

subject to arrangement between agents and owners and/or underwriters.

All these charges are exclusive of out-of-pocket expenses, telegrams and petties. Owners also to pay 1 per cent. commission on disbursements made by brokers. Owners or time charterers may, if desired, remit beforehand sufficient cash to cover cost of disbursements, in which case the 1 per cent. would not be chargeable.

In cases where an advance of cash is made by the brokers, he shall immediately notify the owners or party concerned. Should the amount of the advance be remitted within four days, then only a minimum of $\frac{1}{6}$ per cent. will be charged to cover the cost of passing cheques through the bank, but should the remittance not be received until after four days have elapsed, then the charge of 1 per cent. must be maintained. Where owners are domiciled abroad a period of seven days will be allowed.

CARDIFF AND BRISTOL CHANNEL SHIPOWNERS' ASSOCIATION.

The annual meeting was held at the Cardiff Exchange, on Thursday last week, when Mr. W. E. Jones (the retiring chairman) presided. The report and statement of accounts having been adopted, the chairman stated that there would be no election for the chairmanship during the ensuing year, as Sir W. H. Seager was the only candidate, the other nominees having withdrawn in favour of Sir William.

Sir W. H. Seager, in the course of his address, thanked them for the honour of electing him as the chairman. There were many matters which would come before them which would be of vital importance to the shipping industry. In some quarters the question had been raised as to whether shipping was a basic industry. In his opinion, the shipping industry was the root of the country's commercial prosperity and supremacy. There were many hardships which shipowners were called upon to bear during the past year. They were singled out from other industries, and were penalised to an extent which they did not deserve. He referred in particular to the Finance Act of 1917, under which shipowners were not given the right, as was enjoyed by other industries, to recoup any losses that might be sustained within one accounting period from excess profits tax paid in another accounting period. There were many industries which made considerably more profit than the shipowning trade. A well-known trading company had paid 212½ per cent. in dividends last year, and in the three preceding years had paid 100 per cent. Still, that firm was allowed to make up its pre-war standard by recouping losses in one period out of another, while shipowners were forbidden to do this, and had to suffer in consequence. Dealing with the shipbuilding outlook, Sir William said that while on a visit to the North of England the other day, he had made inquiries as to the output of tonnage from a great authority, and he was told by that authority that once they got into their stride they would be able to launch eight good-sized vessels every week.

He (Sir William) was convinced that it would be a calamitous mistake for the State to attempt to undertake in the fullest sense of the term the nationalisation of shipping. If British shipping was to maintain its position, the actual working of the industry must be left as much as possible in the hands of the men who had brought it up to its highly-developed condition before the war. Under the arrangement created by the late Government, the State was a sleeping partner in their great industry—a partner who took nearly £110,000,000 per annum of the profits, while the shareholders, who took all the responsibilities and risks of running the ships, only received in dividends £30,000,000 during a year of abnormal prosperity. A strong, prosperous shipping industry, working in the closest agreement with the State, was one of the greatest national assets which the Empire could possess, and this was the objective for which they should aim.

Its development had been entirely due to the courage, skill, and initiative of our shipowners and shipbuilders, and our merchant seamen. Over a long period of years it had not been a remunerative industry. The very considerable profits which shipowners had enjoyed in consequence of the war constituted the natural reward of their prudence and foresight in building up a great fleet in time of peace, and the British public had no ground of complaint against a body of men whose enterprise placed at the disposal of the Government at the outbreak of war, a magnificent and perfectly mobilised transport service, without which it would have been quite impossible for the Empire to have taken up its proper functions in the war.

He appealed for the support of members in the direction of encouraging British boys to train as officers and men for the mercantile marine. There were plenty of boys willing and anxious to serve in the merchant marine, and he was sure no member would object having to incur a little additional expense if by so doing they were able to secure British lads for British ships. There was plenty of room, and there were plenty of opportunities for British boys, and if the movement he indicated was supported they would have no cause to regret their action. In this connection, Sir William went on to pay a tribute to those gallant men who had faced the hidden dangers of the sea during the present national crisis, and also a tribute of respect to those who had unfortunately fallen victims to the submarine warfare. He moved the following resolution:—"That the members of the Bristol Channel Shipowners' Association assembled in annual meeting, wish to place on record their great appreciation of the magnificent and heroic services rendered to the whole Empire by the officers, engineers, and men of the mercantile marine, by their devotion to duty during a period of great trial. Danger has never deterred them from carrying raw materials and foodstuffs to this country, and to our gallant and noble Allies, thus making one of the finest contributions to the winning of the war."

Mr. W. E. Jones (the ex-President) seconded the motion, which was agreed to unanimously.

The Chairman referred to the statement made in the House of Commons with respect to the large amount of money which had, apparently, been secured by the Government as a result of the requisition of ships. Mr. Holt, in a very able speech, had pointed out that the Ministry of Shipping had already received a sum of £95,000,000. This large amount had been received consequent upon the high freight rates which had been charged by the Government.

Sir W. H. Seager proposed, and Mr. Dan Radcliffe seconded, a vote of sincere thanks to Mr. W. E. Jones, the retiring President, for the able and energetic way in which he had discharged the duties of chairman during his year of office.

A resolution was adopted protesting against the action of the Controller of Coal Mines in regard to the retention of the one-third of 5 per cent. brokerage on coal exports.

The following officers were elected for the ensuing year:—

Chairman.—Sir W. H. Seager.

Vice-chairman.—Lewis Lougher.

Executive Committee.—John Cory, Daniel Radcliffe, W. W. Jones, W. E. Jones, R. O. Sanderson, J. Emlyn Jones. An equal number of votes were given for the seventh seat to Sir W. J. Tatem, J. C. Gould and W. Smith.

Arbitration under the Bunker Coal Trimming Tariff Board.—Daniel Radcliffe, J. Sidney Rees, G. A. Harrison, Fred Jones and W. T. Gould.

Representatives on the Cargo Trimming Disputes Board.—Daniel Radcliffe, Trevor S. Jones and Lewis Lougher.

Representatives on the Shipowners' Parliamentary Committee.—Sir W. H. Seager and Daniel Radcliffe.

Representatives on the Cardiff Shipowners' Provisions Pool Committee.—J. Emlyn Jones, S. W. Hansen and J. Howard Jones.

Representatives on the Central Executive Committee for the Supply of Coal to France and Italy.—Daniel Radcliffe, J. Emlyn Jones and R. O. Sanderson.

Representative on the Chamber of Shipping.—Daniel Radcliffe.

Odense Shipyard.—A new shipyard has been commenced in Odense by a company with £27,500 capital. At first only one type of vessel will be constructed, viz., a motor auxiliary of about 200 gross tons.

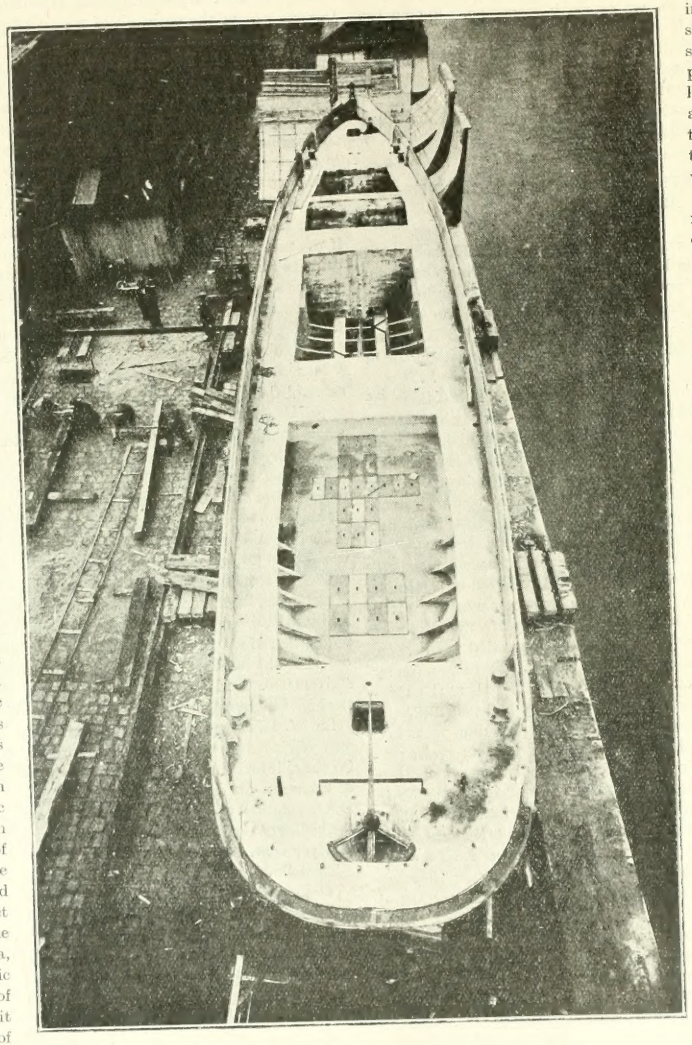
THE LIFE OF THE SEA.

There is now on view at the galleries of the Fine Art Society, 148, New Bond Street, London, a Memorial Exhibition of 100 examples of paintings and water-colours, by the late Charles Napier Hemy, R.A. These pictures, which represent some of the finest examples of the work of this eminent artist, have been grouped together under the title of "The Life of the Sea," and, with but few exceptions, every picture deals with some phase of the ever-changing pageant of the life of the coast or the deep, which the artist loved so well and interpreted so faithfully. Whilst in the collection there will be found one or two pictures representing scenes which the war has, alas! made familiar to all who "go down unto the sea in ships"; the majority were painted in happier days, when the sailor's fiercest enemy was the storm.

Charles Napier Hemy was himself a seaman, for at the age of 15 he ran away to sea, and in later years he retained that love of the sea which, doubtless, prompted this youthful enterprise. His knowledge of the sea is reflected in his pictures, and it is this technical exactitude which, coupled with his inimitable artistic genius, placed him in the foremost rank of British marine painters. He possessed an unerring instinct for interpreting the atmosphere of the sea, and the characteristic life of the toilers of the deep, although it is in the painting of wave forms that we have the most supreme expression of his genius. All who love the sea should make an effort to visit, if possible, this fine collection of pictures.

FRENCH CONCRETE SHIPS.

Among the many different types of vessel which the war has brought into being, none are more novel than the ferro-concrete boats built by our gallant French Allies. These vessels are armed, and act as river transports. They are constructed in a wooden cast or mould which is built in portions, and after the cement has been poured around the reinforcing bars and has set, all that is necessary to make them practically ready for launching is to lift away the various portions of the mould by the simple means of wedges and levers.



General View of Complete Boat awaiting Engines, &c.

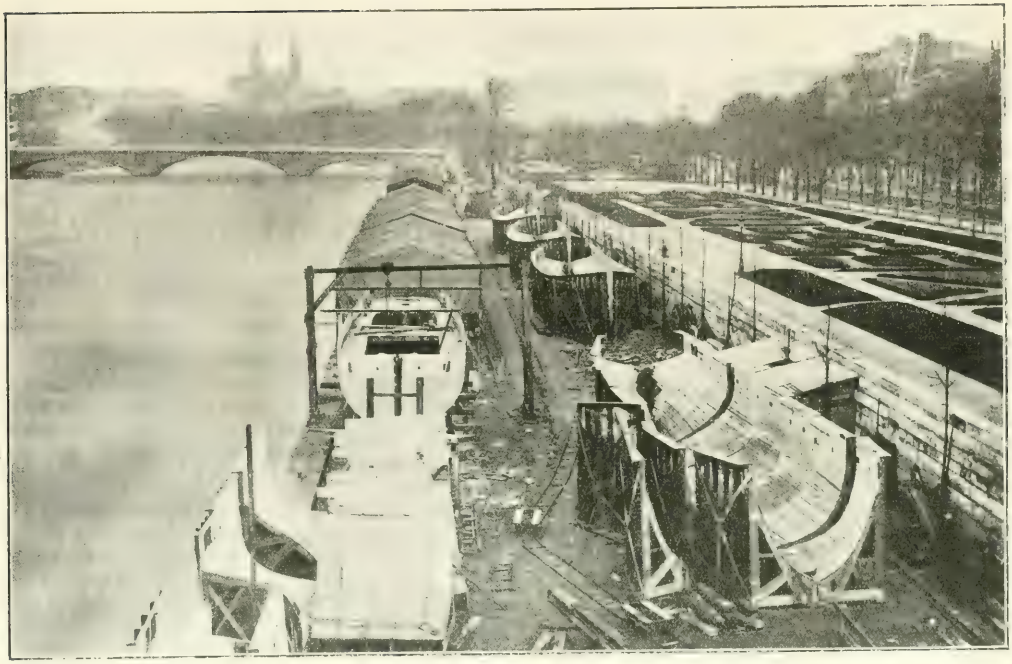
The first photograph, reproduced on the opposite page, is a general view of the building yard, and shows numerous boats in various stages of construction, and the lower photograph shows the interior of one of the vessels under construction, with the various portions of the moulds held in position by metal stretchers while the cement is poured in and during hardening. The photograph reproduced on this page gives a view of the completed hull, the vessel now awaiting the fitting of the engines, &c.

These photographs have been issued by the Topical Press, and passed for publication by the Press Bureau.

Chartering German Ships Interned in Brazil.—A Reuter message from Paris states that the Chamber of Deputies has adopted a Bill authorising 110,000,000 fr. for chartering, by the French Government, of German ships interned in Brazil.

Delays at Durban.—In consequence of the recent serious delays to shipping in Durban, Mr. A. H. Rennie, of the Harrison-Rennie Line, has resigned his membership of the Port Advisory Board, in a letter to which he described the conditions as "serious and disgraceful," mentioning, at the same time, that his firm had received a communication from the Commonwealth Government Line to the effect that the question will arise sooner or later whether it would not be advisable to avoid Durban as a port of call. Mr. Rennie added that the decision to put the floating dock out of commission was never mentioned to the Board. He learned of it through an official announcement.

FRENCH CONCRETE SHIPS.



General View of Building Yard, showing Boats under Construction.

View of Interior of Boat under Construction, showing Steel Reinforcement.

A NATIONAL INDUSTRIAL RESEARCH LABORATORY.*

Some 17 years ago I spoke on "The Aims of the National Physical Laboratory." I endeavoured to make clear the reasons for its establishment and to indicate some of the work we hoped to accomplish. Now that another great change in our position is about to take place and, as I trust, a wider sphere of usefulness is offered to us, it is not unfitting to put on record something of what has been done and to indicate, though it must only be in general terms, plans for the future.

Let me commence then with a few statistics as to growth and work. In 1901 the staff consisted of three scientific assistants working in some small rooms at the Kew Observatory, and the old Observatory staff; the income was perhaps £5,000. When I lectured last, arrangements were in progress for moving the Laboratory to Bushy House, Teddington. To-day—or rather from April 1 next—we shall be organised in eight different departments, each with its own superintendent and a large staff of scientific assistants and observers. The staff now numbers well over 500 persons, of whom about 180 are women. The expenditure during the current financial year will be considerably above £100,000. Quite recently several acres of ground adjoining the Laboratory have been secured and large additional buildings are being erected; these are required for urgent war work. Many of these departments have been erected by private generosity. Thus, Sir A. F. Yarrow, Bart., gave £20,000 for the William Froude National Tank, Sir Julius Wernher erected the Metallurgical Laboratory at a cost of £10,000, Sir John Brunner gave £5,000 to the Electrical Laboratory, while many friends—including the Royal Commissioners of the Exhibition of 1851—contributed to the Administration Block and the Optical Laboratory erected in 1913 at a cost of £20,000.

The ordinary expenditure—excluding sums spent on capital account—increased from £5,479 in 1900 to £38,003 in 1913-14, the total income from January, 1900, to March 31, 1914, being £282,545. The sources of this income were distributed thus :—

	£
Treasury Grants to the Laboratory	80,000
,, ,, for Aeronautics	20,182
Receipts for work done	166,833
Donations	15,230
	£282,545

During the same period the capital expenditure was £156,198, provided thus :—

	£
From Treasury Grants	75,941
From private donations	55,967
Provided out of income	24,290
	£156,198

The enormous growth in expenditure from £38.000 in 1913-14 to over £100,000 this year is of course due to the war. The ultimate control of the Laboratory has hitherto rested in all particulars with the President and Council of the Royal Society. They have been responsible for the finances of the institution. Any loss—I am glad to say there has been no loss—would have fallen on the funds of the society; the Laboratory, in spite of its name "National," has really been a private concern of the Royal Society, supported most cordially throughout by six of the leading technical societies, and dependent for part of its income on a grant-in-aid from the Treasury, but in the main from the receipts from fees.

From April 1 next there is to be a change. The scientific control of the Laboratory is still to be exercised by the President and Council of the Royal Society; but the property of the laboratory is to be vested in the Imperial Trust for the encouragement of Scientific and Industrial Research—it is now vested in the Royal Society. The income of the Laboratory, including receipts from fees, is to be vested in, and is to be under the control of, the Committee of the Privy Council for Scientific and Industrial Research. The Laboratory will be managed by an executive committee appointed as heretofore and containing representatives of the great technical societies. In this manner it is hoped to secure financial stability and to retain at the same time the great benefits which have come from the close connection with the Royal Society. In the future, as in the past, the Laboratory will endeavour to discharge two functions; it will be a laboratory of industrial research, and a national testing institution or proving house. There must be institutions where research work is carried on for its own sake, but there is a wide gap between such homes of science and the works of the manufacturer, and it is to fill this that laboratories of industrial research are needed. The work of the discoverer needs development and extension before it can be utilised by industry, and this is the task of the Laboratory of Industrial Research. Or, again, looking at our problem from the opposite side, a manufacturer has some question to solve—the utilisation of a waste product which if it were not waste would make all the difference between commercial failure or success, the discovery of a material with some special properties—*e.g.*, a light alloy of great strength at a high temperature—needed before a new machine can be completed. Such a man must have access to a laboratory fitted and equipped for the purpose with a trained staff having stored experience as the result of previous work or researches on cognate questions. Let me try to indicate some of the methods in which the National Physical Laboratory has endeavoured to fulfil these duties.

Three of the researches referred to in my earlier lecture related to the production of optical glass, the work of the Alloys Research Committee of the Institution of Mechanical Engineers, and the measurement of wind pressure on various structures and surfaces. Closely bound up with the production of optical glass is the study of the properties of refractory materials used in furnaces and elsewhere.

The application of the microscope to investigate the mechanical properties of metals and alloys was comparatively in its infancy in 1901 when I called attention to the then recent work of Prof. Ewing and Mr. Rosenhain on slip-bands. At the Laboratory the study of alloys, principally perhaps the light alloys containing large percentages of aluminium, has been almost continuously pursued first by Dr. Carpenter and now for some years past by Dr. Rosenhain. The various reports of the Alloys Committee of the Institution of Mechanical Engineers must be referred to by those who wish to estimate the importance of that work; it is not too much to say that nearly all the alloys of aluminium now used in the production of aircraft are its outcome. A large number of "special investigations" have gone on in the various departments. By the term "special investigation" is implied some inquiry into a particular subject made at the instance, maybe, of a Government department or of a private firm, *e.g.*, the investigation into the properties of a new material or the cause of failure of some machine or process such as a boiler plate, the crankshaft of an engine, or an autogenous weld. For example, the failure of one of the main roof trusses of Charing Cross Station some years ago led to an interesting inquiry into the strength of welds. Thus, certain aspects of the metallurgy of steel have received very full consideration.

But it is sometimes urged "Why do you need a special laboratory for such work? Can it not be done equally well in one of the university or technical college laboratories?" To this my answer would be that the primary work of the professor is to teach and to advance knowledge, that of the student is to learn how to research and to apply his knowledge. Industrial problems are usually too complex for students, and moreover, the answers are wanted too rapidly to make them subjects of a student's exercise. He will learn by failures; by the inexperienced the right road is only found at last after many tempting tracks leading nowhere have been vainly tried. The manufacturer who comes with a problem which cannot wait will be more sure to find a solution if he applies to men whose daily work it is to attempt such problems and who have

* Abstract of paper read by Sir R. T. Glazebrook before the Royal Institution, February 26, 1918.

the experience of the past to guide them. Moreover, the plant and equipment required is special; the industrial research laboratory must be fitted on the industrial scale. A rolling mill is not an adjunct required in every technical school where the principles of metallurgy are taught, and yet without a rolling mill the study of the light alloys at the National Physical Laboratory could not have been brought to the pitch it has been. The plant and equipment of an industrial research laboratory is provided for the purpose of applying science to industry. The requirements of students and the educational value of the apparatus need not be studied.

And now let me come back to another illustration of the industrial research done at the laboratory closely connected with our original work on wind pressure. The Advisory Committee for Aeronautics was first appointed in 1908 by Mr. Asquith as Prime Minister. It owes its inception to Lord Haldane, and much of the experimental work which it has initiated, and which has had so marked an effect on the efficiency of British aircraft, has been carried out at the laboratory. At present there are five air channels in practically continuous use, and more are being erected. Some years ago I gave some account here of the work by which Bairstow and Busk, starting from Bryan's theory, had solved the problem of stability. It is impossible to tell at present of the progress made since that time, but when the day comes on which the tale can be told it will form a striking example of the work of a laboratory of industrial research, and the results obtained for purposes of war will bear fruit in the rapid progress of civilian aircraft.

The Froude tank is another department of our laboratory of industrial research. Built by Sir Alfred Yarrow in memory of Mr. William Froude, and for the service of the nation, he has had the privilege of seeing it repay its cost many times in the services rendered to naval warfare, while the pages of the Transactions of Naval Architects bear eloquent witness to the value of the work Mr. Baker has done for naval architecture generally. I could multiply instances. Perhaps I have said enough to justify the claim that, though with scanty means, we have been a laboratory of industrial research of real value to the nation.

And now, turning to the future, let us consider what is to be the position of the institution as a central laboratory of industrial research.

It has been suggested that I wish to make the National Physical Laboratory not merely a natural but the only bridge between science and industry. This is not the case; let me quote the concluding words of a lecture delivered by me in Birmingham rather more than a year ago:—

"Associations are to be formed representing various trades or industries; the representatives of these will discuss with representatives of the Advisory Committee, and other experts, questions needing scientific investigation and, when these are determined, the grant, supplemented in most cases by funds raised privately or contributed by the industry, is to be used to carry them out. Such work needs laboratories, and it is here, it seems to me, that the future of the National Physical Laboratory lies.

"In many cases, no doubt, the researches contemplated must go on in special laboratories arranged and equipped for the purpose—laboratories closely connected with the industry it is desired to help, situated at the great manufacturing centres; but there are many other researches of wide interest and great importance for which a central laboratory is the proper house, a laboratory fitted and equipped in an ample manner, with a trained and competent staff, animated, like those, my colleagues, who have built up the National Physical Laboratory, with a love for science and yet withal a keen appreciation of the practical side of the question discussed and a real desire to help our country by the application of science to industry.

"The body controlling industrial science research must have access to a laboratory in which may be studied the many problems which do not require for their elucidation appliances of the more specialised 'works' character or opportunities only to be found in particular localities; where a staff is available, able and experienced, ready to attack under the advice of men skilled in industry the technical difficulties met in applying new discoveries on a manufacturing scale or to develop ideas which promise future success.

"Such a rôle the National Physical Laboratory should be prepared to play, such is the future which I trust may be in store for it."

This work has already been begun. The various trades associations have been formed, or are being formed, for the promotion of research on matters of interest to the members of the trades.

Each such association will probably require its own laboratory, situated, for preference, at the centre of the trade concerned. This will deal with the special problems of the trade, problems which need intimate association with works conditions for their solution and for which the close supervision of men in works is important.

But there are numerous industrial problems which can best be dealt with in a central laboratory. Such, for example, are:—

(1) Investigations into methods of standardisation or of measurement generally.

(2) Investigations into the physical and mechanical properties of materials used in many trades.

(3) Investigations useful to a trade which has no fixed centre but is widespread over the country.

Or, again, a central laboratory will be of service as a means whereby information as to large questions of general interest, investigated either at the central laboratory itself or at the local special laboratories, may be circulated and time saved by placing at the disposal of any special laboratory requiring them the results obtained elsewhere.

Taking these heads more in detail. (1) The work already done in the direction of standardisation has been very great, and unification of standards used in various trades is highly desirable and can only be secured by the existence of a central standardising institution working in close co-operation with local institutions.

(2) Investigations into the properties of materials used in many trades, the work done on light alloys affords a good example of this: work for which the British Aluminium Company have recently shown their appreciation by sending a generous donation of £500 to the funds of the laboratory.

Or, again, the following are a few of the problems which it has been recently stated need solution to satisfy the needs of one important industry:—

(1) An investigation into the physical properties of alloy steels.

(2) An investigation into the conditions affecting the flow of liquid fuel through an orifice with reference to:

(*a*) Proportions of orifice;

(*b*) Temperature of fuel and air;

(*c*) Viscosity of fuel.

(3) An investigation of the stress distribution in irregularly shaped members—crankshafts and the like.

(4) An investigation into the wear of bearings.

(5) Investigations into the material suitable for valves, cylinders and other parts of internal combustion engines.

(6) The efficiency of radiators for such engines.

(7) An investigation into the cause of the lubricating properties of oils with a view to framing a specification for such oils.

It is obvious that the results of all these investigations, while of special importance to the automobile industry, are of great interest to others. Any of them could go on in a properly equipped laboratory, while it is clear that to carry out many a very complete physical and, in some cases, chemical, equipment is needed.

As instances of (3)—Investigations useful to a trade which has no fixed centre, I may give the following:—

Brick and stone, wood and iron, have been used for long, and their properties when employed for building construction are generally well known. This is less true of other more modern

materials—ferro-concrete, for example. There are rules—based no doubt on the best experience available—for estimating the strength of beams, columns and floors, but there is much scope for inquiry. There are other materials besides ferro-concrete urgently calling for examination.

Little need be said as to the fourth section of the work suggested for a National Industrial Research Laboratory.

The importance of the collection and dissemination of information on matters connecting industry and science is clear. At a central laboratory much of the information will be to hand; the accumulated experience of the staff, their knowledge of the work done in the sectional laboratories, their appreciation of the bearing on industry of inquiries in the region of pure science, are all valuable assets and a proper organisation only is needed—by means of a bulletin or in some such way—to circulate their information where it is most needed.

There is ample room for a central laboratory without trenching in the least on the spheres of the local sectional institutions. If the Department of Scientific and Industrial Research is to carry out effectively the work it contemplates, such a laboratory is essential, and my hope is that the National Physical Laboratory may develop into such an institution in close connection, through the department, with local laboratories throughout the country.

One word in conclusion. The workman is worthy of his hire. In the past the scale of pay has certainly not been extravagant, and there is no call for extravagance in the future, but the remuneration offered must be sufficient and the conditions of work fair. To-day there is a great demand for scientific workers, and while commercial life must offer greater prizes than Government service, it is essential, if the necessary work is to be done and the workers retained, that the emoluments of technical posts under Government, and the conditions attached, should be as good as those of the regular Administrative Staff of the Civil Service. This must apply not merely to the heads of the various institutions, but to the rank and file on whose labours success depends. This point I need not labour here, but in pressing it I feel confident I shall have the support of all who appreciate the importance of science to the nation.

SPECIAL RAILWAY FACILITIES FOR MERCHANT SEAMEN.

The Marine Department of the Board of Trade have issued the following notice, which states that special railway facilities have been arranged for merchant seamen of British ships, and that in this notice the word "seamen" is to be taken as including masters, officers, and all other members of the ship's crew who wish to take advantage of these facilities:—

1. Seamen Discharged from Diverted Ships.—When a ship has been diverted by order of the competent Naval or Transport Authorities to some port other than the port at which the crew would ordinarily have been discharged, the seamen will be entitled to travel free (third class) to the latter port from the port of discharge. For this purpose the superintendent before whom the crew are discharged will issue to such seamen as require them special warrants on forms Dis. 6, overstamped or overprinted with the words: "Board of Trade Special Scheme. No fare payable." These warrants will be similar to those used in connection with the transmission of wages scheme, but no payment will be made by the seamen. The warrants must be presented at the railway booking office at least 15 minutes before the train is due to start.

2. Other Discharged Seamen.—Seamen of vessels other than those referred to above who desire to travel to their homes on discharge before the superintendent of a mercantile marine office will be entitled to third-class tickets at a reduced rate. This will be the old single fare without the 50 per cent. increase (that is, two-thirds of the present fare) for a single journey, and the old return fare, without the 50 per cent. increase, for a return journey. For this purpose the superintendent will issue to any seaman who desires it, on his discharge, a voucher in the proper form (Dis. 7). A seaman wishing to avail himself of these facilities must present the voucher at the railway booking office at least 15 minutes before the train is due to start, and must pay to the booking clerk the fare at the reduced rate. The booking clerk will then issue a third-class railway ticket (single or return, as the case may be) to the station named in the voucher. Seamen discharged from diverted ships may, if they desire it, be given vouchers under this arrangement instead of warrants under the arrangement indicated in paragraph 1 above, *e.g.*, in cases where the seaman's home is not at the port at which the crew would ordinarily have been discharged, or where a return ticket is desired. In such cases the seamen would, like other discharged seamen using this voucher, pay their fares at the reduced rate.

3. These arrangements are in force at the following ports:—

Aberdeen	Greenock	Milford Haven
Ardrossan	Grimsby	Newcastle-on-Tyne
Avonmouth	Harwich	Newhaven
Ayr	Hayle	Newport
Barrow-in-Furness	Hull	North Shields
Belfast	Invergordon	Penzance
Blyth	Kings Lynn	Plymouth
Bo'ness	Leith	Port Talbot
Bristol	Littlehampton	Queenstown
Burntisland	Liverpool—	Runcorn
Cardiff—	Canning Place, W.	St. Ives
Barry	Burton Street, N.	Scilly
Penarth	Birkenhead	South Shields
Cork	Garston	Southampton
Dover	London	Stockton
Dublin	Dock Street, E. 1	Sunderland
Dundee	Victoria Docks, E.16	Swansea
Falmouth	Poplar, E. 14	Troon
Fleetwood	Tilbury	Truro
Fowey	Manchester	West Hartlepool
Glasgow	Maryport	Weymouth
Goole	Methil	
Grangemouth	Middlesbrough	

4. Seamen Discharged at Ports where no Facilities are Provided.—Where a seaman discharged before a superintendent at a port at which the arrangements are not in operation has to pay the full fare in order to travel to his home port on discharge, he may apply to the superintendent at his home port for the refund of the difference between the fare paid by him and the reduced fare. He will be required to produce a certificate of discharge in the Form Dis. A, or Dis. 1, showing that he has been discharged before the superintendent of the mercantile marine office at a port at which the special railway facilities are not in operation, and to satisfy the superintendent that he has actually paid the full fare to his home port.

5. Transmitted Seamen.—Seamen availing themselves of the facilities given under the transmission of wages scheme will in future be charged railway fare at the old rate without the 50 per cent. increase.

6. Exceptions.—The arrangements described in paragraphs 1 and 2 do not apply to distressed seamen travelling by rail to their proper return ports, or to any seaman travelling at the expense of shipowners, or to seamen not discharged before a superintendent of a mercantile marine office.

7. Luggage.—Seamen travelling on a Board of Trade warrant (Dis. 6) issued in accordance with paragraph 1, or travelling on a voucher issued under paragraph 2, as well as transmitted seamen, will be allowed to take 112 lbs. of luggage free of charge. Any excess luggage over this amount will be charged for according to a scale varying from ½d. to ⅝d. per lb. according to distance. No excess charge will be made unless it amounts to 6d. or upwards. Seamen travelling to join a ship who are not in possession of the return half of a ticket issued under paragraph 2 will be allowed to take luggage on the same terms on production of a letter from the owner of the ship stating that they are travelling to join the vessel at a certain port on a certain date.

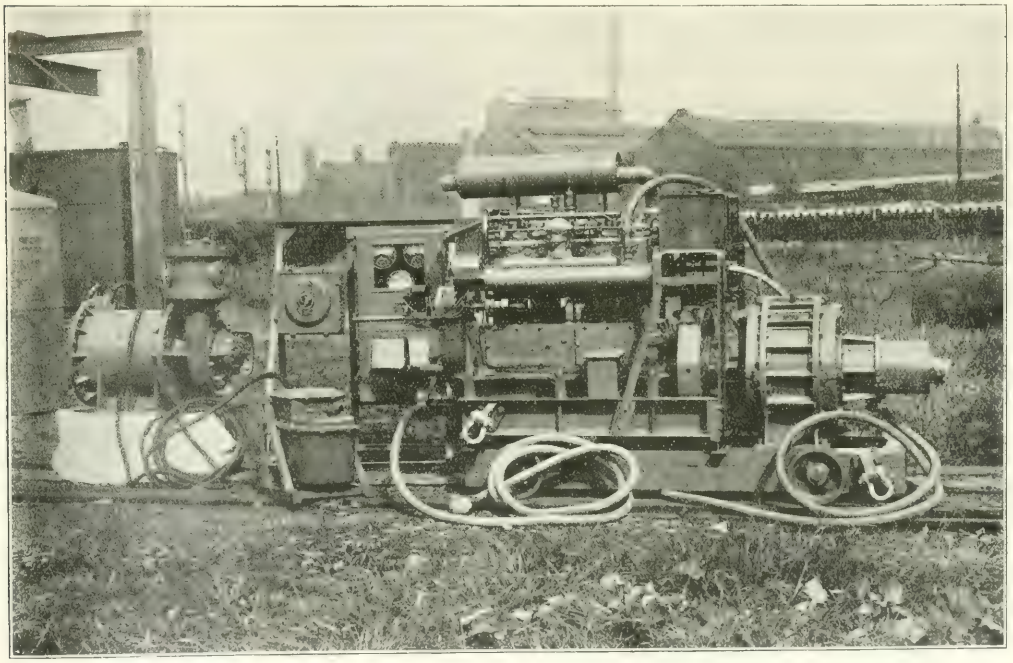
8. This Notice supersedes Handbill 390, dated September, 1917.

SUBMERSIBLE MOTORS.

It can hardly be doubted but that after the war the raising of sunken ships, and not merely the salvage by divers of valuable items of cargo, will constitute a profitable field of activity, and that many attempts will be made to put into service ships now lying on the ocean bed. There are two highly important factors which enter into the general project of raising a shipwreck, and modern developments should render success much more likely in the future than they have been in the past. The first of these factors is the diver, and in this connection it may be remarked that such great improvements have recently been made in diving apparatus that it is now possible for a diver to operate for a limited time at as great a depth as 300 ft. below the surface of the water. The other factor is the pumping apparatus. It cannot be denied that most of the modern salvage exploits have owed much of their success to the state of perfection to which pumping appliances have been brought during the past decade or so, and one of the greatest of these advances is the application of electricity to the driving of submerged electric motors for driving pumps or for operating portable drills and other tools under water.

For many years past efforts have been made to enclose motors in different types of casings, so as to make them perfectly watertight and at the same time airtight, but these efforts have not been successful owing to the fact that the heat generated in the motor has tended to destroy the insulation of the windings. An electric motor has now been produced that can be satisfactorily worked under water, even after having been flooded with water for any length of time, and, in fact, the action of the water is beneficial, rather than otherwise, since it is used to keep the motor cool and to increase its capacity. These motors are made by the "Submersible" & J. L. Motors, Ltd., of Southall, Middlesex, and by a new process of insulation, the windings are made to completely withstand continuous immersion in water. There are no glands or other details which are likely to give trouble, and the motor starts while submerged without the slightest hitch.

In combination with a suitable centrifugal pump, the submersible motor opens up possibilities in salvage work such as have not hitherto been contemplated, and to meet the demand for such a combination, the manufacturers of the "Submersible" motors have designed a combined submersible electric motor and centrifugal pump, the only moving part of which is a shaft carrying the armature of the motor and the impeller of the pump. The whole arrangement is very compact and can be readily lowered down to any part of a submerged vessel, placed in position by a diver and worked from the generators on the salvage vessel either alongside or from any distance away, the electric current being supplied through a flexible cable. In many cases it is only necessary to suspend the pumps from the salvage vessel's derricks and lower into the water without coupling up any suction pipes. Pumping can be immediately commenced after one length of delivery hose is attached, the whole operation being carried out very quickly. The 4-in. standard combined motor and centrifugal pump is capable of delivering 100 tons of water per hour against a manometric head of 75 ft.

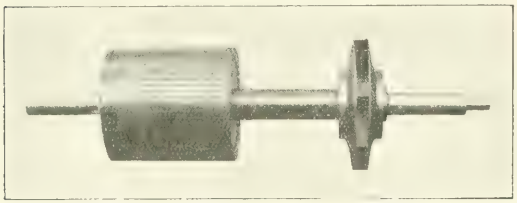


General Arrangement of Complete Salvage Plant.

The enormous increase in the size of the modern liner has placed it beyond the capabilities of the lift of the ordinary portable steam or other pumping machinery. Taking as an example the case of a large vessel stranded on a rocky coast, exposed to the sea and full of water from end to end. It would involve duplicate sets of ordinary pumping plant, with the risk of their being easily damaged on the first approach of bad weather. Submersible motor pumps could be lowered down to any decks below water, placed in position by the diver, and worked from the generators of the salvage steamer, either alongside or from any distance away. In the event of bad

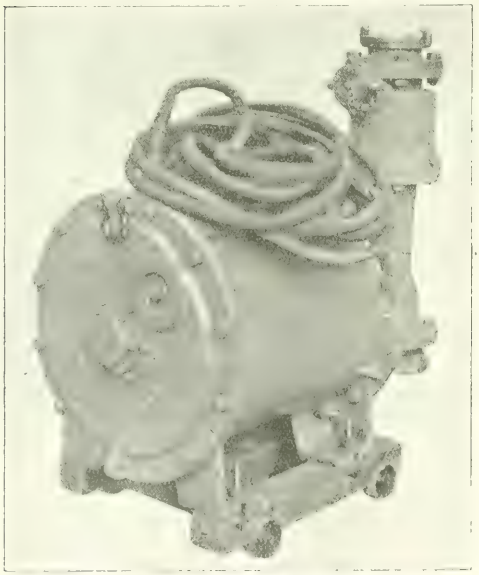
weather coming on, it is only necessary to disconnect the wires, and the pumps, being under water, well down in the hold of the ship, are in comparative safety, and can be started again immediately the weather moderates, by again connecting up the wires.

In cases where it is not possible to obtain a suitable supply of electricity for working the submersible motor pumps a specially enclosed waterproof portable electric generator, driven by paraffin oil engines, for placing on board a wreck is supplied. These machines,



Squirrel Cage Rotor and Pump-Impeller.

being of the enclosed ventilated type with two portholes and ignition covers, can be closed up if the weather becomes too bad to continue working the plant, and can be then left on deck until the weather moderates. In addition to working the submersible motor pumps, the portable generator is also used for lighting, thus

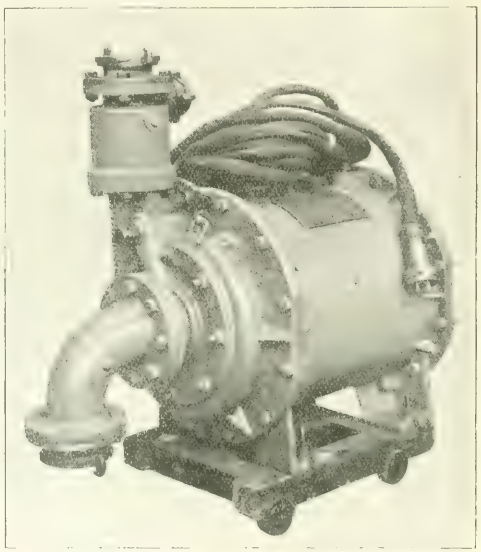


Motor End of 4-in. Standard Combined Motor and Centrifugal Pump.

enabling operations to be carried on night and day; further, it can be used for working any tools, such as drills, &c., driven by submersible motors, which are frequently required during salvage operations.

It is worthy of mention that amongst the users of these submersible motor electric pumps is the Liverpool Salvage Association.

The submersible motor is, however, capable of being applied to another field of activity other than that of salvage work, and that is as an aid in the prevention of a ship sinking when from any cause water is rushing into any part of the interior of the vessel. It is now universally recognised that the electric lighting of a vessel in an emergency should not depend upon the supply of steam from the main boilers. Many instances have occurred—especially during the period of the war—where passenger steamers and cargo vessels have received injury resulting in the flooding of the engine room and stokehold, and in consequence the electric lighting has failed. The absence of light has not only proved a serious drawback to the lowering of the boats, but has also created a panic amongst passengers and crew. These risks are largely eliminated by the provision of an emergency dynamo situated somewhere on the upper deck. Similarly, it is of equal importance that the problem of pumping should not depend on the steam from the boilers or on the ordinary engine-room pumps. It is a fact that is not generally remembered that once a compartment of a vessel is filled to the level of the water outside, collision mats or other devices are of no possible good unless the ship's pumps can be kept working in order

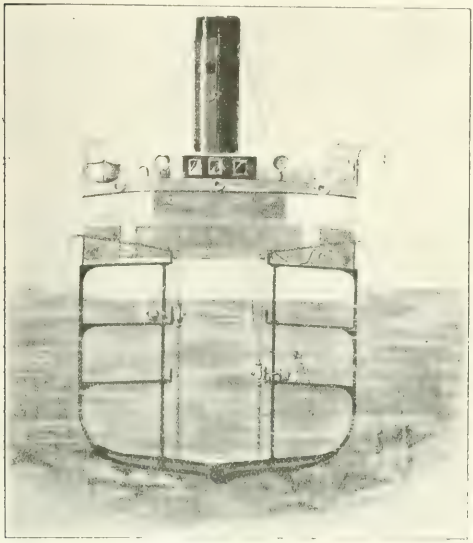


Pump End of 4-in. Standard Combined Motor and Centrifugal Pump.

to create a suction. Hence it is advisable to fit electrically-driven pumps, the power for which can be obtained from the emergency dynamo. A submersible motor in combination with a suitable sized centrifugal pump could be placed in every main compartment of the vessel, and then, should an accident lead to the flooding of this compartment, the pump in this compartment could be started at once, although under water. The system adopted on many ships of installing ordinary electric motor-driven emergency pumps with long suction pipes is easily rendered inoperative through an air leak in the suction pipe, which is liable to occur in any accident, and when such motors are flooded they become useless. The submersible motor pump, being placed at the lowest level, needs no suction piping, as it works submerged advantageously. This is a great improvement on present methods, but there is the much more important item to consider, viz.: that if the pumps can be kept working to create a suction, anything in the shape of beds, blankets, oakum, sacks, &c., can be hauled under the ship

in the vicinity of the opening, and will find their way into the hole and in all probability stop the leak.

For electric boat hoists, winches, capstans and anchor windlasses,



Application of Submersible Pumps to Salvage of Ships.

the submersible motor is claimed to give satisfactory results. In many cases the ordinary type of motors have been found very

Submersible Pump Tested on Liverpool Salvage Association's ss. "Linnett."

unreliable in their behaviour on account of the corrosive influences of the sea air and sea spray, and it must be obvious that a motor which can be employed with reliability under water or exposed to adverse weather conditions is capable of a wide and varied application.

THE IMPERIAL MERCHANT SERVICE GUILD.

Admiral Viscount Jellicoe, G.C.B., was the principal speaker at the twenty-fifth annual meeting of the Imperial Merchant Service Guild, held at Liverpool, on Tuesday evening this week, and he was supported by Captain J. W. Grace (chairman of the Guild), who presided; Mr. Basil E. Peto, M.P. (chairman of the Guild Parliamentary Committee); Sir W. Watson Rutherford; Mr. Gersholm Stewart, M.P.; Admiral H. H. Stileman (Senior Naval Officer at Liverpool); Captain H. V. Simpson, C.M.G., R.N. (Divisional Naval Transport at Liverpool); Captain G. C. Frederick, C.B.E., R.N. (Admiralty Intelligence Department); Captain H. W. Simms, R.N.; and Captain A. W. V. Trant, Superintendent of Convoys, Admiralty; and others.

The annual report, presented by the secretary (Lieut. T. W. Moore, R.N.R.), states that it is just 25 years ago that the late Captain J. G. Moore, assisted by his son, the present secretary of the Guild, laid the keel of this organisation, which has upset the forecasts of those wiseacres who prophesied for it an ignominious collapse and failure. On the other hand, it has year by year grown in strength, and, moreover, the Guild year of 1917, the third of the war, has been a phenomenal one. "The deeds of the mercantile marine will fill a page of history brighter than any other page which will be written after the war" is the official statement of the Guild Committee, and justifiable pride is felt in the fact that no fewer than 1,035 members of the profession, which the Guild represents, have been decorated for outstanding war services. "Yet," proceeds the report, "when we ponder over this record, there remains that imperishable and incomparable honour—the honour of an Empire's undying gratitude to her dead. We bow to the names of no fewer than 900 members of the profession, almost all members of the Guild, who have paid the great sacrifice in this Armageddon."

Notwithstanding the fact that the past year proved to be one of extraordinary stress and strain, the financial position of the Guild has become still stronger. No fewer than 1,347 new supporters (including associates) have subscribed their names to the membership roll; clear evidence, the report says, that the work of the Guild continues to merit the whole-hearted support of the profession. The income from subscriptions alone amounted to £12,703, whilst interest on investments, less tax, amounted to £1,592. A profit on the year's working of £76 has been transferred to the balance-sheet. It should be noted that this is after placing no less than £2,500 during the year to the credit of the Guild War Fund, and £1,000 to the Captain Fryatt Memorial Fund. The accumulated funds of the Guild now stand at the substantial figure of £46,381, excluding the Emergency Fund which totals £1,068, and the deposit at bankers for working contingencies of £1,047. These figures, the Committee believe, will assist the members to realise the great advantage they possess in the feeling of security induced by the knowledge that the Guild has powerful financial reserves, which is an all-important factor in a great cause such as that in which the Guild is engaged. The report then proceeds to describe in detail the work of the executive staff at headquarters, and the different agencies which, besides legal defence cases of members, refer to pay of mercantile marine masters and officers, rates for sailors, employment department, torpedo pay, reduced income tax, the Silver War Badge, a standard uniform for the merchant service, the interned seafarers, Captain Fryatt Memorial Fund, &c.

Orion Steamship Company, Copenhagen.—The share capital is being raised from £66,000 to £132,000 by the issue of shares at 200 per cent. The company paid 75 per cent. dividend for 1916.

STEAMSHIP APPLIANCES.

THE THERMO-ELECTRIC PYROMETER.

The means of indicating at a distance the temperature of superheated steam at various points in the steam range, and the temperature of the exit gases from the boilers, has been found of great utility in the efficient running of steam-raising plants on both land and sea.

The old and more crude method of fixing on the steam range

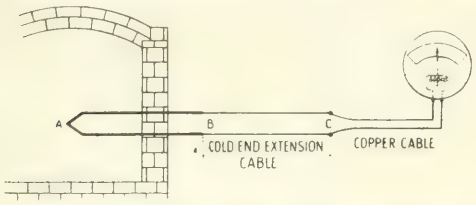


Fig. 1.—Diagram of Thermo-Electric Pyrometer.

small receptacles or pockets into which are placed glass mercury thermometers is inconvenient, and the breakages are many. It is highly important that the various temperatures should be faithfully recorded, either at the central control platform on board ship, or, if necessary, in the engineer's cabin, as by this means those vital matters are under constant supervision.

The thermo-electric pyrometer, which permits of this system of distant indication, has been applied with conspicuous success to many plants on shore, and on ships now forms a part of every modern equipment.

The principle of the thermo-electric pyrometer is extremely simple, and is already fairly well known. The outfit, which is constructed to record from 0° C. to 1,360° C. in ranges suitable for the work on hand, consists of three parts only, *i.e.*, the thermo-couple, the indicator or recorder, and the connecting leads. The thermo-couple comprises two dissimilar metals, usually in the form of wires or rods, or tube and rod, joined to each other at one end, and to an electrical circuit containing the measuring instrument or recorder at the other. The heating of the junction of the two metals establishes an electromotive force depending on the difference between the temperature of this junction and that of the extreme ends of the two metals which form the heated junction, referred to as the "hot junction," while the extreme end of the thermo-couple is known as the "cold end."

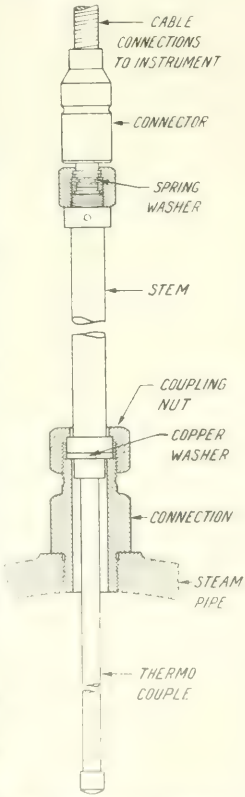


Fig. 2.—Type of Thermo-Couple for Steam Pipe.

In Fig. 1, A is the hot junction and B the cold end of the thermo-couple rod AB. In practice B may attain a comparatively high temperature, and as the reading of the instrument depends on the difference of temperature between the hot and cold ends of the thermo-couple, an error may easily be introduced. Such error is, however, compensated for by the use of the "cold end extension cable," which removes the real cold end to point C, which can easily be maintained at air temperature. This "cold end extension" is formed by two thin wires, generally of similar material to the thermo-couple itself. The junction C is usually fixed at 30° C. for purposes of calibration, but for extreme accuracy the indicator can be set to read any cold-junction temperature by means of a zero adjusting device.

From the terminals of the thermo-couple leads are carried to the indicating instrument, which may be fixed up in any convenient place. It takes the form of a robust moving coil instrument similar to those used for indicating current and voltage on ordinary switchboards. No batteries are required, since the hot end of the thermo-couple immersed in the steam establishes an electromotive force which depends on the temperature.

Fig. 2 shows a form of thermo-couple suitable for use in steam pipes and equivalent positions. The connector employed is concentric thus obviating the possibility of reversals, and providing a clean neat job, and it is customary for the cables connecting the thermo-couple to the instrument to be protected by being drawn into flexible metallic tubing. This procedure is not, however, absolutely essential, since in many places the leads can be conveniently cleated along the run, and, being out of the way, are not liable to damage. The flexible metallic tube is, however, extremely convenient in many otherwise unfavourable circumstances, as it is of the highest importance to avoid damage to the leads.

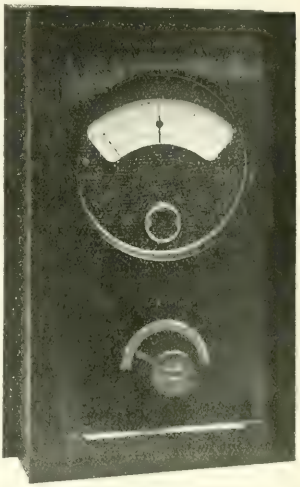


Fig. 3.—Indicating Instrument and Selector Switch.

In some installations a number of these thermo-couples are inserted at various points, and are connected at will to the indicating instrument by means of a selector switch, as illustrated in Fig. 3. It will be observed that the indicating instrument and its switch are mounted in a lock-up case, the switch handle projecting from the cover.

The form of thermo-couple employed for inserting into the uptake for measuring exit furnace gas temperature is usually a straight rod 3 ft. long, the outer tube being about $\frac{5}{8}$ in. diam., forming one element of the couple, the inner element being taken down the centre and welded to it at the hot end.

For superheated steam work the usual range of the instrument is up to 750° F., the steam temperature being given direct on the dial.

These instruments are supplied by Kelvin, Bottomley & Baird, Ltd., and can be seen at their premises in Cambridge Street, Glasgow.

GENERAL NEWS SECTION.

PERSONAL.

Mr. William Margrave, who died at Swansea, at the age of 76, had carried on the business of coal exporter for over 40 years.

Mr. T. R. Thompson and Mr. C. E. Stallybrass have been re-elected chairman and vice-chairman of the Barry Pilotage Board.

Mr. A. R. Dawson has been appointed Collector of Customs and Excise at Cardiff, as from April 1 next. Mr. Dawson has, for the past four years, held a similar position at Swansea.

Sir Chas. A. Parsons, K.C.B., F.R.S., has ratified his acceptance of election as a Vice-President of the recently inaugurated North Eastern Section of the Junior Institution of Engineers.

Mr. W. H. Raeburn has had the honour of Knighthood conferred upon him by the King, on his retirement from the office of President of the Chamber of Shipping of the United Kingdom.

Mr. Harry Cocks, of the Cardiff firm of Harry Cocks & Co., has been appointed on the staff of the Admiralty as technical adviser in connection with equipments and outfits for new vessels under construction.

Captain E. R. G. R. Evans, the gallant Commander of H.M.S. *Broke*, paid a visit to the Cardiff Exchange, when Mr. Dan Radcliffe described him as the hero of one of the most brilliant naval actions of the war.

Commander Sir Edward Nicholl, R.N.R., has accepted the invitation of the Merchant Seamen's League to contest Cardiff at the General Election as a Parliamentary candidate in the seamen's interests.

The death has occurred of Mr. John Rutherford, Secretary of the Marine Insurance Association, Sunderland. He was 59 years of age, and had been connected with this association for 35 years, having succeeded the late Mr. Shadforth.

In the absence, on military duty, of the President, Earl Percy, the senior vice-President, Lord Joicey, will preside at the annual meeting of the North of England Steamship Owners' Association in Newcastle, on Wednesday, March 20.

Mr. A. Munro Sutherland spoke at a matinée performance at the Empire Theatre, Newcastle, on Thursday, on behalf of King George's Fund for Sailors, and announced that the sum of £400 had been realised by the effort.

Mr. Benjamin Joseph Jacob, J.P., late partner in the firm of B. Jacob & Sons, Ltd., lightermen and tug owners, 441, New Cross Road, S.E., whose death occurred on January 24 last, left estate valued at £21,648, with net personalty £17,688.

Mr. James Marr, shipbuilder, who had become disqualified to occupy a seat on the River Wear Commission, owing to non-attendance due to his being engaged on Government work in London, has been unanimously re-elected a member of the Commission.

Lieutenant John Philip Sousa, the famous bandmaster, has written a new march, "The Volunteer," dedicated to Mr. Edward N. Hurley, Chairman of the United States Shipbuilding Board and the Shipbuilders' Union. The march is to help the campaign for raising an army of 250,000 shipyard volunteers.

Sunderland pilots would appear to have a notable record for longevity. George Gibbins, a well-known Wear pilot, has died at the age of 87 years. He is survived by a brother, also a pilot, aged 90 years. The deceased's father and grandfather were pilots, the former living till he was 80, and the latter till he was 90 years of age.

The following gentlemen have been elected by the Committee of Lloyd's as underwriting members:—Mr. Dizney Leith Cran Crombie, of Barr, Crombie & Co., Ltd., ship owners, 53, Bothwell Street, Glasgow; and Mr. Geoffrey Gladstone Taylor, partner in the firm of Bethell, Gwyn & Co., shipbrokers, 22, Billiter Street, London, E.C. 3.

Mr. Thomas Guthrie Williamson, of Allerton Tower, Woolton, Liverpool, of the firm of G. H. Wakefield & Co., corn brokers, Liverpool, and formerly a member of the Board of Directors of the Reliance Marine Insurance Company, Ltd., whose death occurred on November 14 last, left estate valued at £133,378, with net personalty £131,777.

The death occurred last week of Mr. Duncan Mackinnon, in his 74th year. Mr. Mackinnon was a nephew of the late Sir William Mackinnon, in whose firm of East India merchants he obtained his early business experience at Glasgow. As a young man he went to Calcutta, and ultimately took charge of Mackinnon, Mackenzie & Co., agents of the British India Steam Navigation Company. On his return to London he was appointed a director of the company, of which he afterwards became chairman. He retired a few years ago, and was succeeded by Lord Inchcape.

The death occurred, on March 2, at Plymouth, of Sir Joseph Arthur Bellamy, J.P., in his 73rd year. In 1872 he became a partner in the firm of Luscombe & Co., shipbrokers, Plymouth, and later he succeeded to the business, which he developed considerably, and was also successful in forming several cargo-steamer companies, of which he was managing director. From 1886 to 1890 he was honorary secretary of the Chamber of Commerce, of which body he subsequently became chairman, and during those years, owing largely to his efforts, improvements were made in the mail services, and, consequently, a larger number of ocean steamers called at the port. For many years he was chairman of the Sutton Harbour Improvement Company, Ltd., and of the Plymouth & Stonehouse Gas Light & Coke Company, Ltd. He was also, for a long period, Consul for the Netherlands and Russia, and Vice-Consul for France and Spain. Mr. Bellamy had the honour of knighthood conferred upon him in 1904.

PORT NOTES.

Naples.—The Acting British Consul-General at Naples writes that the Council of Ministers has approved new plans for amplifying the port of Naples and developing the surrounding country into a new industrial zone. The carrying out of this scheme will be greatly facilitated by the large extent of low-lying ground available. Unlike Genoa, with its cramped hinterland, Naples offers far greater advantages as a distributing centre for other Mediterranean ports owing to its greater proximity to the main artery of trade between east and west. Besides aiming at developing the suburban manufacturing districts, the scheme includes an enlargement of the port itself and the construction of new wharves and breakwaters. The necessary funds, estimated to amount to some £2,000,000, will be largely met by the Banca di Napoli; the scheme will also be State-aided to the extent of some £140,000 annually. Provision for this latter amount will be made in the Budget for 1919-20, and it is calculated that the work should be completed in seven years from its commencement.

FROM OUR CORRESPONDENTS.

CLYDE DISTRICT.

(From Our Own Correspondent.)

Ardrossan Harbour Dues.—The harbour dues at Ardrossan have been raised as a result of the increase of wages granted recently to the harbour employees in terms of an award issued by the Committee on Production.

Boys for the Mercantile Marine.—Efforts are being made at present to secure a larger number of boys of the Clyde Training Ship *Empress*, in order that they may be trained for the Mercantile Marine. At the annual meeting of the Clyde Training Ship Association last week, Lord Inverclyde suggested that juvenile offenders who appeared in the Glasgow Courts in connection with trivial offences might be sent to the ship. There was accommodation on board the *Empress*, he said, for 400 lads, and the number at present in residence was only 275. In view of the present state of matters, and in a country such as ours, it was of utmost importance that boys should be encouraged to take up a seafaring life. Mr. J. R. Harrison said that when lads had completed their training on the ship they were half-fledged seamen and able to command a living wage of £4 per month, while after a year at sea under present conditions they would be able to earn £7 per month.

Additional Labour for the Shipyards.—The arrangements for the introduction of additional labour into the Clyde shipyards have now been completed, and batches of men are arriving regularly. Up till the end of last week over 1,400 men had passed through the offices of the Labour and Housing Department of the Admiralty, which was established in Glasgow recently. The men have been allocated to shipyards in the district. Housing accommodation has been found for them, and for others who are due to arrive, in hostels which have been specially fitted up by the Department. In order to provide accommodation for the workers a number of hotels have been taken over in Glasgow, and one of these is being used as a clearing depot. On the lower reaches of the river where there are not so many hotels or other suitable premises in existence, greater difficulty has been met with in providing accommodation for the workers brought into the district. At Port Glasgow the authorities hope to secure a school for use as a hostel, and negotiations are proceeding with a view to securing premises at Greenock also for the same purpose.

Engineering Foremen's Grievances.—A good deal of dissatisfaction exists at present among foremen in the engineering industry on the Clyde and elsewhere in Scotland with regard to the wages and conditions of service. Some time ago the movement took practical shape, and an organisation was formed called the Scottish Foremen's Protective Association, with a membership of over 1,000. Meetings of the association have been held in Glasgow, Greenock, Paisley and elsewhere. Among other things the foremen complain that they are paid in many cases less than the men they are in charge of. In order to rectify the position, however, the North-Western Engineering Trades Employers' Association sent out a memorandum in December last, recommending an increase of wages to foremen. As the matter was left to the discretion of the individual employers the foremen complain that the recommendations were not fully carried out in a good many cases. A few of the firms acted up to the order, but others they say, instead of granting an advance of 25s. retrospective from August, 1917, gave 22s., some 20s., and others only the 12½ per cent. and the 5s. advance granted to the men, while in not a few cases all bonuses on output were removed, thus reducing the value of the advance granted. The matter has been taken up by the Foremen's Association who are endeavouring to secure a uniform advance all round.

Delays to Shipping.—In giving decision on the many wages claims that come before them, it is not often that the Committee on Production comment on the attitude of either workers or employers. They have, however, added some strong criticism on the action of the dock labourers at the Ayrshire ports to an award which was recently issued in connection with an application by the men for an advance of wages. The applicants were granted an increase, as we stated here last week, but in their award the Committee state that it has been brought to their notice that the harbour authorities at [illegible] Ardrossan, Ayr, Irvine, and Troon have experienced difficulty, on emergency, in getting the men to work overtime and at the week-ends in order to facilitate the clearance of shipping. Cases have also arisen of men having ceased work on particular vessels owing to their demands for special increased rates not being conceded. Such action is in direct contradiction to the agreement which exists between the parties. In view of the conditions which prevail at present it is impossible to secure regular sailings, and it is of the utmost importance in view of the shortage of tonnage that the greatest possible expedition should be employed in the loading and unloading of ships in order that they may again become available for the carriage of food and other essentials. The Committee feel that the attitude of the men in regard to the matter shows a lack of appreciation of the gravity of the national crisis. They consider that steps should be taken by the officials of the Dockers' Union to impress upon the men the seriousness of their responsibility in regard to the speedy despatch of ships.

SCOTTISH EAST COAST DISTRICT.

(From Our Own Correspondent.)

Dundee Harbour Workers' Wages.—The Special Committee of Dundee Harbour Board have agreed to grant an increase of 1d. per hour to certain classes of workmen employed by them in order to bring their rates of wages up to that paid to men in similar employment in the city. The night watchmen at the harbour were refused a further increase, as it was stated that their wages had been raised from 24s. 10d. to 35s. 8d. since the war broke out.

Dundee Harbour Finances.—The continuance of the war is having a somewhat adverse effect on the finances of Dundee Harbour Board. At a meeting of a committee of the Board last week, the matter was under consideration, and, in view of the probable results of the current year's business, it was suggested that application be made to the Board of Trade to permit the suspension of payments to the sinking fund of the Harbour. This suggestion was approved, and instructions were given that the application be forwarded to the proper quarter.

Shipbuilding at Burntisland.—A scheme is being promoted for the establishment of a shipyard at Burntisland on the northern shore of the Firth of Forth. It is understood that the preliminary arrangements are well forward in connection with the scheme. A lease of ground at the West Harbour has been obtained. About seven acres have been taken in and the Harbour Commissioners are stated to have given the ground on terms acceptable to the promoters. It is stated that the project has the support of some leading industrial men in Fife, and also of engineering firms in Edinburgh, and on the Tyne. A capital of £150,000 is aimed at, and £65,000 is the estimated preliminary cost, including the necessary buildings.

NORTH-EAST COAST DISTRICT.

(From Our Own Correspondent.)

R. & W. Hawthorn, Leslie & Co., Ltd.—Sir Herbert B. Rowell, chairman of directors, presided at the adjourned annua meeting of R. & W. Hawthorn, Leslie & Co., Ltd., held at the St. Peter's Works, Newcastle. At a meeting last September thei dividends were passed, and on this occasion the accounts were presented and confirmed. Effect was also given to the proposals foreshadowed by the chairman last year. These were the subdivision of the £10 shares into shares of £1 each, the increasing of the capital to £1,250,000 by the creation of 692,700 new shares of £1 each, and the bringing of the articles of association up to date, with power to capitalise undivided profits.

Tyne Docks Charges. The North Eastern Railway Company have increased the charges at Tyne Docks as from March 1 by 50 per cent. in respect of assistance in moving vessels, wharfage on goods, storage of goods in dock warehouses, cranage, weighing, and all miscellaneous dock charges. The effect is that all dock charges except dock tonnage rates or vessels, other than keels, lighters and river craft generally, and labourage charges on goods are subject to the enhanced rate. The charges levied upon coal and coke shipped at the company's docks at Tyne Dock, the Hartlepools and Middlesbrough, and at the Dunston staiths are increased 50 per cent., the new tariff being 1½d. per ton for coal and 2¼d. per ton for coke.

Reinforced Concrete Vessels. Several North-East Coast shipbuilders are interested in the Wear Concrete Building Company, Ltd., which has secured a site at Sunderland for the construction of vessels in reinforced concrete. This is the first enterprise of its kind on this part of the English coast. Contractors are now laying out the ground which is on the north bank of the river between

Southwick and Castletown. There is space for about eight berths, and on these vessels up to 300 ft. in length can be built. At the outset it is intended to construct steam tugs, lighters and other small craft, and later, as the undertaking develops, to build cargo boats of the smaller type. It is hoped to be able to lay the keel of the first craft in May.

Water-Power Development.—A subject quite out of the ordinary run of those reviewed before the members of the North-East Coast Institution of Engineers and Shipbuilders was presented at the last meeting of that body in Newcastle, and in a very attractive manner. Professor J. C. McLennan, Ph.D., F.R.S., Director of the Physical Laboratory in the University of Toronto, gave an illustrated lecture on "Water-Power Development in Canada," and showed the great uses to which "white coal" can be put when scientifically directed. He pointed out that immense thought had been devoted to the development of water-power in the Dominion with the object of helping industries, and he suggested that Canada should be developed with British capital and not foreign money. There was a vast heritage for British capital, and many Canadians were hungering to see British capital controlling the situation.

Industrial Unrest.—This subject is being widely discussed just now, and a contribution in the direction of finding a solution which has attracted notice on the North-East Coast has been published in pamphlet form by Mr. W. H. Thomas, of Middlesbrough. The writer advocates the increase of productive power per head as a means of effecting an improvement in the general conditions of the workers, and he points out that an improvement cannot be obtained, except to a very small degree, by limiting or even by abolishing the profits of the capitalists. He also recommends that an endeavour should be made to adjust more equitably the rates of wages prevailing among the workers. The relation of the wages of one class of workers to the others should, he thinks, be carefully considered, and those of the lower paid classes raised, so that there might not be in the future so great a difference in the rates as prevailed at present. There were signs that the transport workers, steel workers, and coal miners might become the plutocrats of labour, to the detriment of their fellow-workers.

Shipbuilding Cost Accounts.—A new organisation in Newcastle with the title of the Shipbuilding, Engineering and Steel Commercial Staffs' Association, has made a very promising start, having, after a few months of preliminary spade work, got together a membership of over five hundred. The first lecture under its auspices has been delivered by Mr. George F. McGregor, whose subject was "Shipbuilding Cost Accounts and their relation to Management, Estimating and Accountancy." It was a theme to interest many more people in the industries concerned than those immediately connected with the new association. Mr. McGregor called attention, for example, to the fact that no administration was sound where the compilation of the records of production was not accurate and of such a character as would assist the shipbuilder in healthy competition. That healthy competition, he averred, would not exist in shipbuilding if there was even one firm not in a position to accurately quote for a vessel from actual data, and who might secure a contract at a figure which proved eventually to be considerably below the actual cost. This, he submitted, justified the importance of abandoning the secrecy that had so long existed in the methods of keeping costs accounts, and the claim for a great deal more practical consideration from the naval architect. Mr. McGregor outlined a cost system which could be used with very little additional work for claiming instalments weekly, monthly, or at other periods as might be required.

THE MERSEY DISTRICT.

(From Our Own Correspondent.)

The War Bond Campaign.—Liverpool made a splendid start in the week's War Bond campaign by subscribing roughly £4,000,000 on Monday. The total sum includes £2,000,000 from the Leyland Line, £400,000 from Alfred Holt & Co. (Blue Funnel Line), £100,000 from T. E. Brocklebank & Co., and £50,000 from the International Navigation Company.

Liverpool & London Steamship Protection Association, Ltd.—The committee, in their 36th annual report for the year which ended on February 20 last, state that the tonnage now entered in the Association still considerably exceeds 4,000,000 tons, and there is, in addition, considerable tonnage, representing vessels taken up by the Admiralty, which has been temporarily withdrawn. The calls for general claims (including subscriptions) made during the past year amounted to 8.3d. per ton, and the average of the calls since the Association was formed in 1882 is 5.9d. per ton. The general claims paid since December 31 last, and which will form part of the next quarter's call, amount to £17,740. The total calls for passenger claims since 1882 is £341,967, equal to £9,499 per annum. During the year, Mr. T. Harrison Hughes (chairman of the Liverpool Steam Ship Owners' Association) and Lieut.-Commander A. B. T. Cayzer, R.N., have become members of the committee.

The Bridgewater Canals.—Mr. W. C. Bacon, presiding at the annual meeting of shareholders of the Manchester Ship Canal Company, last week, made an interesting reference to the Bridgewater part of the Ship Canal undertaking. The Bridgewater Canals have, since March 1, 1917, he told the shareholders, been worked by the company under the direction of the Canal Control Committee, on behalf of the Board of Trade. An agreement has recently been entered into with the Board of Trade, the effect of which will be to ensure to the company, in respect of each full year's working, a net revenue substantially equivalent to that of the pre-war year, 1913. The effect of this arrangement has operated in the accounts for 1917 in respect of ten months' working, and the result is that, against a loss of £2,454, in 1916, which would, of course, have been largely increased this year, owing to the further war allowances given to the Bridgewater Canals workmen, there is a profit of £19,648, after taking credit for the estimated amount of compensation payable by the Board of Trade under the agreement.

Manchester Chamber of Commerce.—One cannot help but admire the very practical methods of the Manchester Chamber of Commerce, which, presided over by the well-known shipowner, Mr. R. B. Stoker, of the Manchester Liners, Ltd., bestows so much attention on shipping and transport affairs. There has just been added to the effective force of the Chamber a Shipping Merchants' Committee, which will deal with oversea freightage and other such matters.

Mr. Stoker also announced at the annual meeting of the Chamber, last week, that, as the question of rail, canal, road and coasting transport was assuming increasing importance, the board had appointed a Transport Committee to specially devote its attention to this subject, under Mr. Marshall Stevens' chairmanship. The aim of this Committee is to assist in providing for the improved transport requirements of the country, both in making provision for the movement of all merchandise traffic, and in doing so upon at least equal terms with our competitors of other countries; and, instead of transport being considered to be adequately dealt with by being incidentally tacked on to some other particular trade, as has been the custom in the past, the Chamber is treating it, as should always be the case, as a separate and special subject represented in all its various sections by members of the trades concerned.

SOUTH WALES DISTRICT.

(From Our Own Correspondent.)

State Control of Shipping.—The following resolution was passed at a meeting of Cardiff shipbrokers: "That, in the interests of the shipping industry, it is desirable that the proposed continuation of Government control after the war be strictly confined to military and naval necessities, and limited to a period of not more than six months, and that the terms of control be so modified as to place the tonnage concerned on a remunerative basis."

Coal Controller and Brokerage.—At a meeting of shipbrokers at Cardiff, Mr. W. S. N. Heard drew attention to the interference of the Controller of Coal Mines with the time-honoured custom under which the merchant or exporter had invariably received as part and parcel of the charter-party, a share of the 5 per cent. chartering commission, amounting, except in a few unusual circumstances, in the case of shipments to France and Italy, to one-third of the 5 per cent. Eventually a resolution was passed protesting against the action taken by the Controller.

Bunkers for Time-Chartered Neutral Steamers.—The following copy of a letter to the Inter-Allied Chartering Executive from the Controller of Coal Mines has been posted on the Cardiff Exchange:—"With reference to your letter of November 22 on the subject of the price of bunker coal supplies to neutral vessels time-chartered to France and Italy, and running under neutral flags at limited freights in the French and Italian coal trade, I am directed

by the Controller of Coal Mines to say that he agrees that bunker coal may be supplied to these vessels under the same conditions as the supply of bunkers for vessels sailing under the flags of the Allied nations at limited freights in the French and Italian coal trade."

Admiralty and Shipbuilding Schemes.—The following is a copy of a letter received by the Lord Mayor of Cardiff from Major-General A. S. Collard, Deputy-Controller of the Admiralty:—"I have to acknowledge the receipt of your letter of February 15, with reference to the announcement in the press relating to shipbuilding on the River Usk. I am to state, for the information of your council, that the Admiralty has not departed from the policy as stated by the deputation from the Admiralty that waited upon you in Cardiff. No promise was made to the deputation from Newport regarding the construction of a new shipbuilding yard on the River Usk. I am to add that should the Admiralty depart from their present policy in this connection, the claims of Cardiff would receive every consideration, and any such change in policy will at once be notified to you, in order that the interests of the district which you represent should in no way be prejudiced."

Newport's Shipbuilding Scheme.—It was stated at a meeting of the Newport Chamber of Commerce that, in connection with the report of the Dominions Royal Commission (Imperial Trade Development) an important statement had been prepared, setting forth the claims of Newport to be recognised as a scheduled port, and this had been laid before the Government authorities. The President gave a report of the deputation which waited on the Admiralty in regard to the erection of a shipbuilding yard at Newport. He was not very hopeful of a favourable reply. It was pointed out that the Bristol Channel was essentially a ship-repairing centre. There was another scheme—that of a ship-repairing yard on the eastern bank of the river. He was afraid, however, the sites on that bank did not lend themselves to this scheme. Mr. Vickery said he had pressed upon the Admiralty the suitability of a site for a large dry dock near the entrance lock at the Alexandra Docks.

Dock Developments at Newport.—At the annual meeting of the Alexandra (Newport and South Wales) Docks & Railway Company, the chairman referred to the new lock entrance which was opened a fortnight prior to the outbreak of war. The experience gained since that time had proved the immense utility of that entrance, and also the South Dock extension, as a means of providing accommodation for the tonnage which it would otherwise have been impossible to have dealt with at Newport, and their policy in making a bid for this traffic had been more than justified. The conversion by C. H. Bailey, the well-known ship-repairers of Newport, Cardiff, Barry and Sharpness, of the disused North Lock entrance of the Alexandra North Dock into a graving dock, has not yet been quite finished, owing to difficulties connected with labour and materials, but Government representatives who recently visited the port expressed appreciation of the value of the work from a national point of view, and all possible facilities were now being given for completion, and it is hoped that this will be accomplished within a few weeks.

BELFAST DISTRICT.

(From Our Own Correspondent.)

Shipbuilding in Londonderry.—The opposition to the Londonderry Corporation Bill, which threatened to seriously retard the development of the shipbuilding industry in that port, and which led to the stoppage of the extension on hand, has been withdrawn, a compromise having been arrived at with the objectors, who were a political group in the Corporation.

Electric Station Site.—There is now every likelihood that the offer of the Harbour Board of an alternative site for an electricity station on the Harbour estate will be accepted. The size originally accepted by the Corporation has been included in Harland & Wolff's recent extension. Owing to pending industrial developments in the city, the Corporation is now contemplating spending £350,000 on the erection of this additional electric station, so as to be able to meet the demands of shipbuilders and all large consumers. The site offered has a double water frontage, and appears to be even more suitable than that at Hamilton Road, which is now part of Queen's Island.

Annual Harbour Board Meeting.—The annual meeting of the Harbour Board, on Feb. 28, was one of the shortest on record. The chairman was able to announce that the receipts were the largest on record, being £12,132 over those of 1916, which was also a record year. The gross revenue was £205,028, and the expenditure £195,159, leaving a net surplus of £9,858. The expenditure shows an advance of £18,444. These results have been obtained in spite of decreased tonnage, exports and imports, which are entirely due to war causes. The recent lettings to shipbuilders will bring in permanent ground rents amounting to over £10,000 per annum, making a total rent roll, chiefly from building lands, of about £30,000 per annum.

Belfast Harbour Bill.—As a result of a conference held on Friday between the Belfast Coal Trade Association and the Law Committee of the Belfast Harbour Board, the petition of the former body against the Harbour Bill has been withdrawn. The Association was apprehensive lest the execution of the works proposed in the Bill would interfere with their trade, but the Commissioners were able to assure them on the point, and also to guarantee that the trade would benefit under the Bill. The coal trade is hampered for want of space, and the Association was merely out to safeguard its members rather than to oppose the Bill and the general provisions of which they are heartily in support. Conferences are still taking place between the representatives of the Corporation and the Commissioners regarding their petition against the Bill. It is generally felt that unless the Corporation persists in raising the issue of the harbour franchise, the other points in dispute will be adjusted satisfactorily. The petition of the Belfast & County Down Railway Company has not yet been withdrawn, but at the annual meeting of that company, on Feb. 28, the chairman intimated that it was purely a friendly petition.

THE FREIGHT MARKETS.

(From Our Own Correspondents.)

London.—On the Baltic Exchange chartering conditions are without noticeable change. The competition for available tonnage is as strong as ever, especially from North America and the East, and rates, consequently, remain high. From the River Plate to the United Kingdom 200s. can be had, and to France 205s. To the United States $20 offers on net form of charter. The North American Atlantic seaboard is interested in tonnage on net form at 230s. to the United Kingdom, 260s. to France, 330s. to the French Mediterranean, and 360s. to Italy. Gulf loading is worth 30s. more. For heavy grain from the Northern Range ports 50s. would be paid to the United Kingdom; 56s. 3d. to France and 75s. to West Italy. There is little or no trade in coal cargoes Virginia to the Plate, and values are based on about 80s. Nitrate offers at 185s. to the United Kingdom. The Eastern section of the market is without alteration. From Karachi to the United Kingdom 250s. on scale basis is the ruling figure, and from Bombay, on d.w., 275s. to the United Kingdom, and probably more than 400s. to the Mediterranean. Kernel cargoes can be had at 550s. from the Madras Coast to Marseilles, and from the rice ports of Saigon and Burmah 500s. would be paid to the United Kingdom or France. In the Mediterranean trade the ore and phosphate ports are chartering steadily on the basis of 45s. Huelva to the Mersey, and 60s. Huelva to the East Coast United Kingdom for pyrites, 65s. Tunis to the Clyde, 50s. Bougie to the same destination, 70s. Sfax to Bristol Channel, and 50 fr. Bilbao to Boulogne. Bay business is indicated by fixtures at 20s. Bayonne to Bristol Channel, and 17s. Bordeaux to the same destination.

Glasgow.—Lifelc s conditions have again prevailed on the Glasgow market throughout the week, the supply of tonnage being insufficient for the requirements. Rates were firm all round. Among the fixtures reported were the following:—Aden, 4,000, Calcutta Rs. 28, April; Bordeaux, 2,000 and 2,700, Bristol Channel, 17s. prompt; time charter States and West Indies, 2,500, 35s., one round trip, delivery and redelivery, States; and New York to River Plate, 85s. 6d. prompt. Ship chartered, River Plate to New York, 83s. 6d.

Newcastle-upon-Tyne. Requisitioned vessels to load coal cargoes on official account continue to arrive in improving volume, thereby considerably benefiting the local coal trade. This is especially true so far as the Northumberland steam coal collieries are concerned, the employment of Durham gas coal pits being still rather patchy, some pits being well provided with transport facilities, whilst others are being starved. Neutral tonnage is still in woefully inadequate supply, however, and, despite the firm maintenance of rates for nearly all directions, the volume of chartering reported is exceedingly small. So far as Sweden is concerned, there have been two 1,900-ton steamers

fixed, one at 155kr. and the second at 160kr., and two vessels for Stockholm—a 2,200-tonner at 162½kr. and a 1,300-tonner at 165kr. These rates compare with from 155kr. to 162½kr. for Gothenburg and 170kr. for Stockholm, reported last week, being a slight reduction for the former and a considerable reduction for the latter port. A 1,600-ton vessel has been taken up for Trondhjem at 140kr., interesting as being the first fixture for Norway to be noted for several weeks. In all other neutral directions there has been absolutely nothing doing—excepting for the fixture, at Newcastle, of a 3,400-ton vessel for Tees loading to Malaga at 440s., a rate accepted for Humber loading last week. The coaling stations remain based on 100s. to Gibraltar and 200s. to Port Said. The Spanish Atlantic is still listed at about 180s. to Bilbao or Santander. Portugal is represented by quotations of 115s. to Lisbon and 125s. to Oporto. The Spanish Mediterranean is quoted at 440s. to Barcelona. Not a single coasting fixture at the new fixed rates has yet been reported.

Liverpool.—This market continues to have an abundance of inquiries, but there is very little free tonnage to meet same, either for outward, homeward, or time charter engagement. Rates, which are generally unchanged from a weeek ago, keep firm all round. A coal boat Wales to Huelva made 420s. and any neutral boat to Spain can get big figures. Two boats, Port Said to Calcutta, with salt, have been fixed at 42s. 6d., and a like cargo of 7,000 tons Port Said to Rangoon made 42s. March. Time chartering slow for want of boats, and business done is confined to North and South American trades at recent rulings. Little business can still be done from the East, except with parcels for liner tonnage. Saigon is still offering 500s. to France, and Madras 550s. to Marseilles, while Bombay quotes 275s. d.w. to United Kingdom, and 250s. scale terms are indicated from Karachi. Tonnage on net form charter continues to be booked to this country from North America at 230s. Heavy grain rates from Northern Range to United Kingdom are firmer and up to 50s. is obtainable, while 56s. 3d. is quoted to French Atlantic, 72s. 6d. to Marseilles, and 75s. to Italy. Plate homewards quiet and nominally 200s. to United Kingdom. Nitrate ports dull, and indicate 185s. to this country and 200s. to Mediterranean.

Cardiff and Swansea.—Conditions, generally, remain without change. Orders are numerous, especially for Allied destinations. Business for neutral countries is kept in check owing to the reluctance in paying the extremely high rates demanded. Record figures continue to be paid for Spanish ports, and it was reported that a steamer was recently fixed at the record rate of 420s. for Huelva. Barcelona is quoted at between 400s. and 420s. Transactions disclosed were: Havre, 21s. 6d. (Allied); Caen, 48s. (neutral); Rouen, 48s. 9d. (neutral), and Nantes, 29s. (Allied). A steamer was fixed for Buenos Ayres at 150s. On the Swansea market a firm tone prevailed throughout all departments. The inquiry for tonnage was active, but actual business done has not been large, owing to the continued scarcity of tonnage supplies. The only business reported was:—Caen, at 46s. 6d. and 48s.; Rouen, 48s. 9d.; and Trouville, 48s. Neutral vessels being engaged in each instance.

Hull.—The market has been firm in tone and a moderate business is all that is doing at present, owing to the great difficulty of securing tonnage. In the North French market a fairly active trade is being done all round owing to the strong need for fuel in France. In the West Station section a fairly good inquiry is maintained, but operations are restricted as boats cannot be easily obtained for any long distance trade. All the neutral markets are extremely quiet.

THE COAL MARKETS.

(From Our Own Correspondent.)

Throughout the country the coal trade pursues the even tenour of its way, and in no district has there been during the past week or two any outstanding feature to record or any noteworthy change. While the export position is no better and trade at the chief coal exporting ports is slow and restricted, the inland demand, in consequence of the large home consumption arising from the great munitions and manufacturing activity, is very considerable. It shows no signs of abatement, but rather tends to increase. While the markets of the North-East Coast and South Wales, as well as the Scottish markets, are, therefore, rather dull and inactive, the Midland markets are very busy, the fulfilment of running contracts alone necessitating a great deal of activity on the part of the collieries, salesmen and merchants.

The bunker trade shows no signs of improvement. Even with the North-East Coast, where shipping is still moving with some freedom, there is no especial call for bunkers, and the South Wales ports provide only a meagre inquiry for bunker fuel. Of course, bunkers which are the subject of official requisition are moving away freely enough, but outside of these there is only a small demand. Durham bunkers can, therefore, readily be obtained at the official minimum, which is from 24s. to 27s. 6d. Special bunkers for export are not in very plentiful supply and command more than the 30s. which is quoted. South Wales bunkers are in more than plentiful supply, and can be obtained at 20s. to 24s.

A quiet, steady tone has characterised the coal markets of the North-East Coast. A little animation has been provided by inquiries by the Norwegian and Danish State Railways for some large quantities of steam coal, 100,000 tons being required by Denmark, and tenders have been sent in. The Norwegian railway contracts have been allotted to Newcastle firms, the price being 5 per cent. above schedule prices. The position of steam coal of the best quality is satisfactory, but secondary qualities are not so well placed, and smalls are without movement and stocks are too large. Durham coals are in demand, house coal being at busy trade though gas coals are fairly plentiful. Coke, too, is in request, and but for the shortage of railway rolling stock would provide a brisk business. Approximate prices are for Best Blyth steams, 30s. to 32s. 6d., and smalls, 18s. 6d. to 20s. 6d.; Tyne primes, 29s. 6d. to 32s., and smalls, 25s. to 27s. 6d.; second steams, 25s. 6d. to 29s. 6d., and smalls, 18s. 6d. to 20s. 6d.; North Northumberland steams, 28s., and smalls, 20s.; smithies, 25s. to 30s.; nuts, 32s. 6d. to 33s. 6d.; Durham gas coals, 23s. 6d. to 30s.; coking coals, 17s. to 25s.; house coal, 20s. to 22s. 6d.; foundry coke, 42s. 6d. to 45s.; blast furnace coke, 35s. 6d.; bunkers, 24s. to 27s. 6d.; and specials, 30s.

Operations on the South Wales coal markets have been very limited in number and extent. Still the contract business keeps the markets occupied, and lately shipments on contract account have been much better. More tonnage has come to hand and loading has proceeded uninterruptedly. Best quality steam coals are moving off fairly well and seconds are fairly well stemmed, while bituminous and gas coals are readily taken up. The position in regard to small coals shows no improvement, however, and considerable stocks are held by the collieries. Patent fuel is in demand, and the coke market is strong in tone.

Prices are approximately for best large steam coal, 35s. 6d.; second steams, 33s. 3d. to 34s.; ordinary steams, 32s. 6d.; drys, 31s. to 32s. 6d.; steam smalls, 20s. to 24s.; best large black vein, 32s. 6d.; Western valleys, 31s. 6d.; Eastern valleys, 30s. 6d. to 31s. 6d.; nuts, 30s. 6d. to 32s. 6d.; duff, 16s. 6d. to 20s. 6d.; house coal, 33s. 3d. to 35s. 6d.; No. 3 Rhonddas, large, 33s. 3d., and smalls, 28s. 6d.; No. 2 Rhonddas, large, 29s. 6d., and smalls, 19s. 6d. to 21s. 6d.; through and through coal, 24s. 6d. to 26s.; gas coal, 23s. 6d. to 27s. 6d.; and patent fuel, 32s. 6d.

The Scottish coal trade is not in an unsatisfactory position, for though exports are much below the normal quantity the home demand is very large, and, therefore, the collieries manage to work full time and get rid of the production from their pits. Conditions are perhaps best in the West of Scotland. Fifeshire and the Lothians are more affected by the lack of export facilities. Generally speaking, however, the Scottish coal trade is fairly brisk.

Prices, subject to the addition of the 2s. 6d. per ton coal wage increase, are, for splint coal, 28s. to 30s.; Hartleys, 29s.; ell coal, 26s. 6d. to 28s.; screened navigations, 28s. to 30s.; unscreened navigations, 25s. 6d. to 29s.; steam, 27s. 6d.; nuts, 21s. to 23s.

On the Hull coal market the position is without change, the marked feature still being the absence of any free coal. All available supplies are earmarked for official or contract requirements. The export to France is pretty considerable, and a good quantity goes south, to London and other places. The inland demand shows no signs of slackening. Shipments to neutral countries are of no account. Prices are firmly held at, for Hartleys, 30s.; large steams, 32s. 6d.; Yorkshire steams, 30s.; gas coal, 27s. 6d. to 28s. 6d.; house coal, 30s. to 32s. 6d.; [illegible] to 27s. 6d.; and nuts, 22s. 6d. to 23s. 6d.

The Midland coal trade is [illegible] the pressing requirements of the munitions and manufacturing centres, but the mild weather of the past month has allowed a certain quantity of house coal of the least bituminous kind to be diverted into this channel. Nevertheless, the collieries are still working at full pressure.

On the London market operations have not been very brisk, the demand, owing to the mild weather conditions, having been

unusually light. This applies more particularly to house coal, stocks of which are larger than anticipated. Supplies of coal are coming to hand tolerably well, and the demand for steam fuel shows no signs of diminishing.

COMPANY MEETINGS.

Manchester Ship Canal Company. The 69th annual meeting was held in Manchester on February 27.

The Chairman (Mr. W. C. Bacon), in moving the adoption of the report, expressed satisfaction at the progress made during the year in spite of difficulties, and at their ability to pay increased dividends. The year just closed had brought its own special difficulties and anxieties, and it was a matter for satisfaction that they were again able to recommend the payment of increased dividends. During the year there had been restrictions on imports and exports by the Government, and they all recognised that this was necessary in the interests of the country; but the result as regards the Port was a reduction of 696,843 tons as compared with 1916. The year 1916 also showed a decrease of 575,787 tons as compared with 1915; that, of course, was a matter over which they had no control. All that the directors could do, he added, was to endeavour to see that a fair share of the country's traffic was dealt with at the Port and bring the facilities of the Port to the notice of committees of the Government and our Allies which control traffic. The accommodation had been greatly appreciated by all the Government Departments concerned, and their representatives had visited the Port frequently. A large part of all the traffic was now directly or indirectly on behalf of the Government, and in common with other Ports, they had suffered at times from shortage of labour owing to enlistments; but although that had retarded loading and discharging of vessels, they had been practically free from congestion throughout the year. In spite of the decline in tonnage, receipts showed an increase of £30,312. The result of the new railway working arrangements would be less profitable, because receipts per ton remained the same, while expenditure had largely increased. Further, what the future held for the country generally and for them in particular was a matter on which he did not feel he could say anything in the direction of forecast, beyond impressing them with the Directors' sense of their responsibility.

The Deputy-Chairman (Alderman Wilson) seconded the motion, which was carried.

Merchants' Marine Insurance Company, Ltd.—The 47th ordinary general meeting was held on February 27 at the offices, 37, Cornhill, London, E.C.

The Chairman (Sir Ralph Collingwood Forster, Bart.), in moving the adoption of the report, said that before proceeding with the actual business of the meeting, he would like to refer to the great loss sustained by the company in the death of Mr. Akroyd Hyslop, who for so many years was their underwriter, and to say that their success in the past was very largely due to his great ability and zeal. The Chairman then said that the underwriting account for 1916 had, like its predecessor, resulted in a satisfactory profit, although it had been found necessary to transfer a much larger sum than usual to underwriting suspense account to close that account. Owing to national requirements, repairs of vessels of all classes were frequently deferred for months, and in some cases for years, and as a result, claims which would in normal times have been settled during the second and third year of an account, were still outstanding. There was also considerable delay in presentation and collection of claims owing to the serious dislocation of the staffs of the many firms and companies concerned. With regard to the 1916 account, the balance on December 31, 1916, after deducting expenses, was £323,938, settlements during 1917 were £170,627, £85,000 had been set aside to provide for future claims, leaving an underwriting profit of £68,311. The interest received during 1916 was £25,203, which, added to the underwriting profit, gave a total profit of £93,514, which marked the most successful year in the history of the company. The net premiums received during 1917 were £516,190, and the claims paid £109,403, or 21·20 per cent.; the expenses were £22,720, and the interest earned £28,085.

The depreciation in the company's investments had given the directors serious concern, and substantial amounts had been written off during the past two years. They had now decided to write the securities down to their market value on December 31, 1917, the amount so written off being £61,306. The company's investments were now shown in the balance-sheet at their market value, and as a large proportion of the depreciation had occurred since the outbreak of war, they hoped that no further writing down would be necessary. The sum of £25,000 had been transferred to a special reserve account, out of which excess profits duty and income-tax would be paid, leaving at the credit of profit and loss account the sum of £68,881.

As to the future, it was impossible in times such as the present even to offer a suggestion as to the prospects of underwriting. The abnormally inflated values of hulls and cargoes, the expansion of the marine insurance market to meet the demand for facilities for insuring these values, the additional hazards—such as absence of lights and removal of the usual aids of navigation, resulting in a greatly increased number of collisions—were all the result of war conditions. With the termination of the war some of these disadvantages would disappear, but the readjustment of values and the wider market both here and elsewhere would not be easy problems to face.

The Deputy Chairman (Mr. Herman Wilmot Uloth) seconded the motion, which was carried.

Belfast Harbour Trust.—The annual meeting was held on February 28, at the Harbour Office.

The Chairman (the Right Hon. Robt. Thompson, M.P., D.L.), in moving the adoption of the report, said there had been a considerable shrinkage in the tonnage imports and exports during 1917 as compared with 1916, which was a record year, but they were not downhearted, as although the tonnage and quayage dues were £2,506 less than 1916, and revenue from vessels lying up in the harbour was £8,773 less, there were other items on which there were considerable increases, such as rates on goods, which had increased £1,484; graving dock rates, £4,636; cranage rates, £748; weighbridges, £431; ferries, £499; and quay rents, £606. The expenditure showed an increase over 1916 of £18,445, which was largely due to the advances in wages and the price of raw materials. Notwithstanding those heavy expenditures, the Commissioners had many resources, and the receipts for the year were the largest on record, being £12,132 in excess of the amount for 1916, which was also a record year. The Commissioners had been able to transfer to surplus revenue account, or what was better known as the reserve fund account, a sum of £9,858 to be carried forward, in addition to contributing £10,544 to the sinking funds, which were maintained in a satisfactory condition. Those funds had now to their credit over £40,000 in excess of the amount which the Commissioners were obliged by statute to have to the credit of those funds. That feature should be a source of gratification to all stockholders, ratepayers, and others who take an interest in the affairs of the harbour. The Commissioners had been able during the past year to let lands for shipbuilding and other purposes, which would bring in permanent ground rents amounting to over £10,000 per annum additional revenue, making a total rent roll chiefly from building lands of about £30,000 per annum. In that connection he might mention that they regarded those new extensions, more especially for shipbuilding, as a very important source of revenue to the port, and further, as a very important contribution to the prosperity of the city of Belfast. To supply the requirements of the shipbuilders, the coal trade, the grain trade, and other important interests which had been clamant for additional accommodation, they had found it necessary to promote a Bill in Parliament, which would enable them after the war to carry out many important improvements. They had been surprised to find that attempts had been made to hinder the progress of the Bill, but they had had no indication of any dissatisfaction amongst the harbour ratepayers, whose interest they felt it their duty to conserve and to consider as a matter of the first importance. Regarding the harbour franchise, to which exception had been taken by one public body, he found on investigation that it was the broadest and most liberal in the United Kingdom. For example, they had three times as many electors as Dublin, and nearly five times as many as Glasgow, three times as many as Liverpool, and nearly two and a half times as many as London. With regard to the works contemplated under their Bill, he would like to ask the citizens of Belfast whether they disapproved of the extensions of shipbuilding by making provision for such docks and wharves as the shipbuilders require? Did they disapprove of 20,000 to 30,000 more citizens being added to the population of Belfast? Did they disapprove of provision being made for the accommodation for more coal merchants, so that there might be more competition, and consumers have the advantage of lower prices? Did they disapprove of facilities being provided for grain merchants, by the erection of grain elevators and other improvements which would tend to reduce the cost of landing breadstuffs?

He thought he might say on behalf of his brother Commissioners and himself that if they found that the citizens of Belfast and the ratepayers of the harbour disapproved of those facilities and extensions being provided, they would not hesitate to withdraw the Bill even at the eleventh hour.

Mr. James McConnell, J.P., seconded the motion, which was adopted.

COMPANY REPORTS AND DIVIDENDS.

Elbe Dampfschiffahrts A.G., Hamburg. The directors again propose to pay 4 per cent. dividend.

Norddeutscher Lloyd.—The company will again publish no accounts and hold no general meeting in respect of 1917.

Parson's Marine Steam Turbine Co., Ltd.—Ten per cent., free of tax (interim). Last year the same dividend was paid.

Prince Line, Ltd.—The directors have declared an interim dividend for the half-year ended December 31, 1917, of 10 per cent. per annum.

Dampfschiffsrederei Union A.G., Hamburg.—For the fourth time this company is exempted from publishing accounts and calling a general meeting in respect of the past financial year.

Flensburger Dampfer Cie.—The general meeting on March 20 will consider a proposal to increase the share capital; also, the proposed dividend of 20 per cent. for 1917 (15 per cent. for 1916).

Ozean Dampfer A.G., Flensburg.—A dividend of 20 per cent. is to be recommended for 1917, compared with 10 per cent. for the previous year. An increase in share capital is under consideration.

World Marine & General Insurance Co., Ltd.—The directors recommend a dividend of 4s. a share (10 per cent. per annum) for the year ended December 31 last, free of income tax, on the paid up share capital.

Penarth Harbour, Dock & Railway Company.—The half-yearly report to December 31, 1917, states that the directors propose payment of the usual dividend of £5 5s. per cent. per annum.

Moor Line, Ltd.—The directors have declared a final dividend of 30s. per share, equal to 15 per cent., which, with interim dividend of 5 per cent., makes 20 per cent. for the year, free of income tax. This compares with 30 per cent. for 1916, and 25 per cent. for 1915.

North's Navigation Collieries (1889), Ltd.—The directors recommend a final dividend for the year ended December 31, 1917, of 12½ per cent. less income tax, making, with the interim distribution, 20 per cent. for the year, payable on or about March 15.

Mercantile Dry Dock Company, Ltd.—The directors have declared a dividend of 8 per cent. for the year, together with bonus of 2s. per share, less income tax. The sum of £6,000 is placed to reserve and £25,695 is carried forward, subject to excess profits duty.

Dividends for 1917.—Dampfschiffsrederei Horn A.G., Lubeck, 10 per cent. (same as last year). Altonaer Hochseefischerei, Hamburg, 12 per cent. (9 per cent. last year). Elbe Dampfschiffahrt A.G., 4 per cent. (4 per cent.). Em. Z. Svitzers Salvage Co., Copenhagen, 35 per cent. (25 per cent.).

Elmshorner Dampfschleppschiffahrt A.G.—The total receipts for 1917 amounted to £4,730. Owing to the rise in ship values, £750 is considered sufficient allowance for depreciation. Other deductions from the gross profit of £1,550 are £138 for renewals, income tax and balance carried forward. A dividend of 8 per cent. is paid.

Jordabergs Reederei A.G.—The accounts for 1917 show a profit of £310, of which £295 is transferred to depreciation. This represents only a few weeks' working (since October last). A share capital of £48,300 was represented at the meeting. E. J. Breckelmann (Rostock), Fr. Fleck, G. Staehr and W. Grunhage were re-elected to the board.

Yorkshire Coal & Steam Shipping Company, Goole.—The report for the half-year ended December 31 last, shows that profit amounted to £3,032 after providing for all liabilities, including excess profits tax and income tax. The directors place £1,000 to depreciation of steamers, and recommend a dividend of 12½ per cent., which will absorb £2,500, leaving £273 to carry forward.

Birmingham Canal Navigations.—The report for the year ended December 31 last states that, owing to the continuance of the war and to the prolonged severe frost in January and February last year, the receipts from tonnage, wharfage and weighing decreased by £6,851, the total being £148,795, compared with £155,645. The rents derivable from property and easements show an increase of £2,057 and amount to £27,866, compared with £25,809. The Board of Trade took control of the undertaking as from March 1, 1917, and the necessary agreement has been entered into by the committee. The balance available for dividend is £32,530. Other moneys will be receivable from the Government under the terms of the control agreement and the ultimate sum required to make up the dividend of 4 per cent. will be provided by the London & North-Western Railway Company in the terms of the London & Birmingham Railway and Birmingham Canal Arrangement Act, 1846.

Marine & General Mutual Life Assurance Society.—The directors' report for the year ended December 31, 1917, states that new life assurances amounted to £202,554 after deduction of sums re-assured with other offices. The net yearly premium income on these was £8,015, and single payments £1,749. Total premium income from all sources amounted to £175,945, an increase of £3,949 over the preceding year. Interest and dividends, after deduction of income tax, amounted to £81,464, and the gross interest to £106,799. The claims by death, including bonus additions, amounted to £87,588. Endowment assurances with bonus additions amounting to £47,380 matured for payment to members during their lives. By the deaths of 24 annuitants payments of £761 per annum have ceased. The surplus on the year's working amounted to £58,421, the assurance fund thereby being raised to £2,239,512. The investment reserve fund of £80,000 which was set up at the close of the year 1914 remains the same, and the depreciation which has arisen since will fall to be dealt with at the next valuation on December 31, 1919.

Liverpool & London Steamship Protection Association, Ltd.—The 36th report of the Committee, for the year ending February 20, 1918, states that the tonnage now entered in the Association still exceeds 4,000,000 tons. There is in addition considerable tonnage, representing vessels taken up by the Admiralty, which has been temporarily withdrawn. The average of the calls for general claims (including subscriptions) from the beginning of the operations of the Association, February 20, 1882, to the present time, is 5·9d. per ton. The calls for general claims made to date, due to casualties happening in each of the last 12 years, including subscriptions, have been as follows:—1906, 5·8d.; 1907, 4·7d.; 1908, 8·7d.; 1909, 4·9d.; 1910, 5·6d.; 1911, 4·5d.; 1912, 13·7d.; 1913, 5d.; 1914, 7·4d.; 1915, 5·3d.; 1916, 4·8d., 1917, 2·2d. The calls for general claims (including subscriptions) made during the past year amounted to 8·3d. per ton, made up as follows:—In respect of claims arising in 1914, 0·5d.; 1915, 2·1d.; 1916, 3·5d.; 1917, 2·2d.; total, 8·3d. The general claims paid since December 31 last, and which will form part of next quarter's call, amount to £17,740. The total calls for passenger claims since the establishment of the Association is £341,967, equal to £9,499 per annum.

Powell Duffryn Steam Coal Company, Ltd. The report for the year ended December 31, 1917, states that after making allowances for excess profits duty and coal mines excess payments, writing off depreciation, and making other provisions which the directors think necessary, there is a balance of profit for the year of £521,744. Out of this amount interim dividends have been paid of 3 per cent. on preference shares (less income-tax) and 10 per cent. (free of tax) on ordinary shares, amounting in all to £172,238, leaving £349,506. To this must be added £113,131 brought forward, making a total of £462,637. The directors recommend a final dividend of 3 per cent. (less tax) on the preference shares for the year ended December 31, 1917; a final dividend of 10 per cent. (free of tax) on the ordinary shares for the year; to reserve for income tax, in respect of dividends paid on the ordinary shares for the year 1917, £111,709; to general reserve account (making it £575,000) £75,000; carrying forward £103,690. The output of coal from the various collieries for 1917 was 3,722,873 tons, an increase of 63,857 tons over the previous year. The concentrated ammonia plant has been in operation the greater part of the year, with satisfactory results, and a further tar distillation plant is now in course of erection. In view of increased demands for electrical power and compressed air, an additional 5,000 kw. turbine alternator set has been ordered for Bargoed.

Canada Steamship Lines, Ltd.—The management is evidently taking advantage of exceptional opportunities to place the company in as favourable a position as possible to meet conditions likely to

prevail after the war. This policy is reflected in the appropriation of over $1,000,000 (£200,000) for depreciation, notwithstanding the increase that has occurred in the value of all cargo vessels, and in a reduction of the funded debt of $1,300,000. During the year the company has paid off all arrears of dividend on the preferred stock. These, together with regular dividend for the year, required a total of $2,479,166. After making these larger appropriations the company was able to increase the surplus by over $500,000 net, the surplus now standing at $2,374,754. The gross revenue for the year amounted to $13,533,815, as compared with $12,122,428 in 1916. Operating expenses, owing to abnormal conditions, rose from $8,062,583 in 1913 to $9,509,951, leaving a net revenue of $4,023,864, as compared with $4,059,544 and $1,732,057 in 1915. The net revenue is equivalent to 10·70 per cent. on the common stock. The surplus in the previous year, together with 1917 profits and $941,879 profit on the sale of fixed assets, made a total of $4,968,506. After payment of all dividends and charges there was a surplus of $2,374,754 against $1,848,225. Regarding the outlook, the directors state that the company has a promising field for development and expansion on the high seas. The total tonnage of the company is now greater than a year ago, in spite of losses that have occurred.

Redcroft Steam Navigation Company, Ltd.—The following circular letter has been issued to the shareholders: "We have pleasure in enclosing warrant for dividend at the rate of 10 per cent. free of income-tax for the half-year ending January 31 last. The directors regret they are unable to present their annual report and statement of accounts for the year ending January 31, with the promptitude that has characterised the company since its inception; this is mainly accounted for by the fact that the steamers were under government requisition, and the adjustment of accounts in respect of same is much in arrear. The meeting will, however, be held as soon as the accounts are ready. The trading for the past year suffered adversely by the misfortunes that attended the company's steamers. The ss. *Lady Charlotte* was totally lost in May last, and the ss. *Lady Plymouth* stranded on the coast of the Isle of Man in February, 1917, and was under repairs until December 28, being out of commission for a period of 10½ months; the ss. *Marchioness of Bute* was the only steamer that had a full year's trading. The new ss. *Lady Charlotte* was delivered by the builders in October, and has since been trading under Government requisition. The very heavy War Risk calls and the increased rates in every department, together with the reduction of earnings has resulted in a very substantial loss on the year's trading, but your directors are relying upon this being made good in accordance with the provisions of the Finance Act, 1917, by the Commissioners of Inland Revenue out of excess profits duty previously paid by the company, a claim in respect of this is now in course of preparation for the consideration of the Revenue Authorities. With a view to the future development of the company, the present is considered an opportune time to issue the balance of the authorised share capital, and it has been decided to offer the 50,000 £1 ordinary shares to the present shareholders in the first instance, in the ratio of one new share to two old shares at 50s. per share."

COMPANY REGISTRATIONS.

Mee, Billing & Partners, Ltd.—Capital, £10,000, in £1 shares. Objects, to enter into an agreement with a company of the same name (in liquidation). Iron, tinplate and metal manufacturers and merchants, shipowners, carriers by land and sea, agents, underwriters, &c. Signatories:—

W. A. Stearns, [illegible] Street, E.C., merchant.
J. A. Ells, [illegible] Street, E.C., merchant.

The first directors are W. A. Stearns, Mrs. M. Stearns and J. A. Ells, each of whom may retain office while holding £10 shares. Registered office, 37, Lime Street, E.C. Private company.

South African Marine, Fire & General Insurance Company, Ltd.—Particulars filed February 25, 1918. Registered in Cape Province, South Africa, in August, 1917. Capital, £2,000,000, in £5 shares. British address, 15, St. Swithin's Lane, E.C. 4, where J. Brice is authorised to accept service. Directors: P. R. Frames (British by birth), Johannesburg; Sir David Harris, K.C.M.G. (British by birth), Kimberley; Friedrich Hirschhorn (naturalised ... Union of South Africa, of German origin), Kimberley; S. B. Joel (British by birth), 2, Great Stanhope Street, W. 1; Sir Carl [illegible], Bart., [illegible], Newport, Essex; F. Otto [illegible], [illegible]; and E. F. Phillpotson Stow (British [illegible]).

Ernest Herbert & Co., Ltd.—Capital, £1,000, in £1 shares. Objects: To carry on the business of shipowners, ship and insurance brokers, managers of shipping property, freight contractors, ice merchants, refrigerating storekeepers, &c. Signatories:—

E. H. Wagon, 9, Sedgley Road, Crumpsall, Manchester, shipping agent.
A. Ellison, 89, Falkland Road, Egremont, Cheshire, clerk.

The first directors are to be appointed by the subscribers. Solicitor: F. E. Kent, 8, Harrington Street, Liverpool. Private company.

Construction & Commercial Corporation, Ltd.—Capital £20,000, in £1 shares. Objects, to construct, equip, control and administer ships, docks, harbours, piers, wharves, canals, &c. Signatories:—

C. Larder, Camomile Street Chambers, E.C., incorporated accountant.
J. Almarcher (?), The Willows, Bridge —— (?), Maidenhead, gentleman.

The first directors are to be appointed by the subscribers. Qualification, £10. Solicitors, Ashurst, Morris, Crisp & Co., 17, Throgmorton Avenue, E.C. Private company.

Express Engineering Works, Ltd.—Capital, £10,000, in £1 shares. Objects, engineers, manufacturers of boilers, furnaces, &c. Signatories:—

R. R. Shankland, 89, Leadenhall Street, E.C., shipbroker.
A. W. Pickard, 7, Great St. Helens, E.C., shipbroker.

The first directors are to be appointed by the subscribers. Qualification, £1. Registered office, 7, Great St. Helens, E.C. Private company.

QUESTIONS IN PARLIAMENT.

Bulkheads of Torpedoed Steamer.

Commander Bellairs, on February 28, asked the Parliamentary Secretary to the Shipping Controller whether his attention had been drawn to the loss of a certain steamer, and whether the Department had previously received a communication from practical seamen protesting against the insufficient number of only five bulkheads provided in the vessel; and whether the experience in this instance, where the vessel was standing on end within 3 mins. of the explosion of a torpedo, was engaging the attention of the Government with a view to increasing the number of bulkheads in similar vessels and thus reducing to a minimum further loss of life and ships.

Sir L. C. Money: The steamer referred to was purchased in America in an advanced state of construction. A communication was received in December, 1917, signed by certain officers and engineers, drawing attention to the number of bulkheads. The matter was thoroughly investigated and explained to these officers and engineers, and they expressed themselves as content to proceed with the ship provided the question was kept in view. The investigation showed that the bulkheads were not of an unusual arrangement, and as to strength were in full accordance with Lloyd's requirements, and that the ship was fully classed. The fitting of an additional bulkhead would have involved laying the ship up for a considerable period, and it was eventually decided, upon a balance of considerations, that the matter should stand over until a more convenient opportunity. The approved specification for standard ships provides for an additional bulkhead, and this extra bulkhead is also being fitted in ships similar to that in question acquired abroad at an earlier stage of construction.

Ships' Davits and Tackle.

Sir J. D. Rees, on February 28, asked the Parliamentary Secretary to the Board of Trade whether the latest and best davits and tackle were always used for British shipping at the present time; and whether any loss of life had been sustained in cases where vessels had been torpedoed owing to defective provisions in this behalf.

Mr. Wardle: Constant improvements are being made in davits and tackle, and it is not possible to require the latest invention at any particular moment to be adopted compulsorily on every ship, but all boat-lowering gear on board British ships must comply with certain definite conditions, and must be fit for the service for which it is intended. Loss of life has occurred through defective gear, but such accidents as occur in connection with boat-lowering gear are generally due to the conditions under which it has to be used and not to inherent defects in the gear itself.

Mr. Billing: Would the hon. member consider the advisability of insisting that on all ships there should be deck rafts that float off when the vessel sinks?

Mr. Wardle: All these matters are being constantly considered, and every effort is made to save life.

The Army and Shipyard Labour.

Mr. Byrne, on February 28, asked the Under-Secretary for War to state the method to be adopted for the release of men from the Army for shipbuilding work; and to whom applications are to be made for the release of shipyard workers?

Mr. Macpherson: Men are being selected by their recorded trades by an Admiralty representative of the Deputy-Controller of Auxiliary Shipbuilding. Orders are at once issued for all men as soon as selected to be sent to the Northern Command Discharge Centre at Ripon for the purpose of transfer to the Reserve for shipbuilding work, provided they are willing and their recorded trade is found to be correct. Another representative of the same Department of the Admiralty is attached to the Discharge Centre at Ripon, who places the men in employment in conjunction with the representative of the Employment Department of the Ministry of Labour. Applications for the release of individual shipyard workers should be made to the Ministry of National Service, who make recommendations as regards all releases of individuals to the War Office.

Sir Henry Havelock-Allen, on February 28, asked the Parliamentary Secretary to the Ministry of National Service what, if any, reserve of men of military age could be drawn without detriment to their efficiency and output from the coal mining, iron and steel, and shipbuilding industries.

Mr. Black: It is not considered to be in the national interest to state the numbers asked for by my hon. friend. The numbers of men to be withdrawn from the various essential industries are in all cases determined after a full consideration of the effect on output as well as of military requirements.

Transfers of Ships and Shares.

Mr. W. Roch, on March 4, asked the Parliamentary Secretary to the Shipping Controller whether his attention had been called to an Order in Council, issued on February 5 last, which prohibited the sale of any ship or the shares of any company giving control of a ship to a British subject; and if he will state why he though it was necessary to issue such a prohibition, which in no way added to the powers of control of shipping abroad possessed over British shipping by the Shipping Controller and which might seriously depreciate the value of British shipping.

Sir L. C. Money: The Order of February 16, 1917, with regard to the purchase of ships, as amended on February 6, 1918, is general in its terms and applies to all classes of ships, British, allied and neutral. In the case of British ships the practice has been not to interfere with the course of the transaction except where it appeared from the particulars which the intending purchaser is required to furnish under the order that the transaction would be contrary to the national interest. I am not aware that the Order has had any effect upon the values of British ships.

Mr. Roch: May I understand that the object is not to prohibit the sale of ship shares to British subjects?

Sir L. C. Money: We have no intention of interfering with any proper transfers. It is only desired to prevent ships passing into improper control.

Shipbuilding Output February.

Answering Mr. G. Lambert, who on March 5 asked what was the amount of mercantile tonnage constructed in February, Dr. Macnamara (Secretary to the Admiralty) said: The returns have not been got in specially for this month. The First Lord will deal with them to-day.

Mr. G. Lambert: But cannot the right hon. gentleman say now something about them?

Dr. Macnamara said that the figures for February although not up to the concluding months of last year were very nearly double those of January.

Ship Repairing.

Mr. Roch on March 5 asked the Secretary to the Admiralty whether the falling off in building new ships during the past three months was in a measure due to the number of ships damaged by enemy action and requiring extensive repairs.

Dr. Macnamara: The work of repairing ships damaged by enemy action has undoubtedly made a large demand on the shipbuilding resources of the country, particularly as regards labour, which would otherwise have been available for construction of new merchant tonnage. The total number of such vessels which are undergoing repairs is 77. Docking accommodation has been arranged for two others and there are five vessels awaiting facilities for effecting repairs. It is estimated that four of the vessels in question will take more than six months from the present date to complete.

Standard Ships.

Answering Mr. Roch on March 5, as to standard ships, Sir L. C. Money said: I am sorry I am unable to state the number of standard vessels on order. The number delivered up to February 28 is 17, of about 85,000 tons gross. Of these one of 5,173 tons gross has been lost.

Replying to the same hon. member, Sir L. C. Money said: Apart from coasting vessels, of which the standard types have not been finally settled, there are 10 approved types of standard ships.

Dutch Shipping

General Croft on March 5 asked the Under-Secretary for Foreign Affairs, whether he was aware that steamers of the Batavier Line had for a considerable time been prevented from sailing to England and continued to lie alongside the quay at Rotterdam; and whether any action was to be taken in the matter.

Lord Robert Cecil: Some ships of the line referred to are laid up presumably owing to the fear of war risks. The whole question of Dutch shipping is now under consideration.

French Requisitioning.

Answering Mr. Roch on March 5, Sir L. C. Money said: The decree which the French Government have sanctioned for the universal requisition of the French mercantile marine takes effect as from March 10, 1918, and not from March 1, as previously understood; this decree provides for the vessels to be taken by the French Government on the basis of a standard charter party, as to the precise terms of which I have no information.

Argentine Exports and Strikes.

Mr. Roch on March 5 asked the Parliamentary Secretary to the Shipping Controller, whether the strikes of workmen in the Argentine were interfering with the shipments of frozen meat and cereals to this and Allied countries; and what steps, if any, were being taken in connection therewith.

Sir L. C. Money: Shipments of frozen meat and cereals have been interfered with only to a slight extent through the recent strikes in the Argentine; the situation is being carefully watched and every effort will be made to obviate further trouble.

Wood-Pulp Cargoes for the U.S.

Mr. Pringle on March 5 asked the Parliamentary Secretary to the Shipping Controller, whether ships on their outward voyage from British to American ports had been diverted to Newfoundland to carry cargoes of wood-pulp produced by the Anglo-Newfoundland Trust to the United States; whether this deviation involved a delay of seven days; and, if so, whether instructions had now been given to discontinue the practice.

Sir L. C. Money: I have inquired fully into this matter since my hon. friend raised it in debate. The reply to the first part of the question is in the negative. No requisitioned ship, and so far as I can ascertain, no ship of any kind, either British, Allied or neutral, engaged in or suitable for transatlantic trade, has been used to carry wood-pulp from Newfoundland to the U.S.A. Certain small neutral and American ships have taken cargoes, in addition to two British ships, one a small whaler, and the other the small passenger ship *Florizel*, which was recently lost. I think I ought to add that the two ocean-going ships possessed by this company, and used by them for the special purpose of carrying their pulp to this country, were requisitioned by the Shipping Controller early in 1917 and are in general service.

Repatriation of Merchant Service Personnel.

In answer to Mr. Peto on March 5, Mr. J. F. Hope (representing the War Prisoners Department) stated: The total number of British merchant officers and seamen and of other civilians repatriated since the Hague Agreement has been in process of execution is 188 and 185 respectively. The number of certificated officers is three. The proportion of merchant officers repatriated to the total interned is very low. I am informed that four German merchant service officers have been repatriated since the Hague Agreement. His Majesty's Government are prepared to carry out without delay the agreement under which merchant service officers and seamen over the age of 45 are specially entitled to repatriation, but the status of merchant seamen generally is the subject of discussion between the two Governments at the present moment; and further steps to secure the repatriation of all such seamen who are eligible under the agreements in force are now being considered. The services of the mercantile marine during the war are most deeply appreciated, and every effort will be made to protect the interests of those members of it who have had the misfortune to fall into German hands.

THE PRINCE OF WALES' VISIT TO THE CLYDE SHIPYARDS.

The Prince of Wales paid a visit to the Clyde area this week, during which he inspected naval and mercantile work in shipyards and engineering establishments. In the course of his tour the Prince saw for himself the volume, variety, and quality of the war work now being accomplished on the Clyde.

The Prince was received on Monday morning in Glasgow by the Lord Provost J. W. Stewart, and after the presentation of Corporation officials and leading citizens at the City Chambers, visited the King George and Queen Mary Victoria League Overseas Club, before leaving for Greenock. There he inspected the shipyard of Caird & Co., Rankin & Blackmore's marine engineering works, and Scotts' shipbuilding and engineering establishments. Visits to J. G. Kincaid & Co., and Dunlop, Bremner & Co. completed the Greenock part of the programme, and later in the afternoon the Prince inspected the shipyards of Russell & Co. and Wm. Hamilton & Co., Port Glasgow, before returning to Glasgow.

Tuesday was spent on the north bank of the river, between Glasgow and Dumbarton. After inspecting the Kenilworth Admiralty Hostel, the Prince visited D. Rowan & Co.s' engineering works, and the yards of D. W. Henderson & Co., and Yarrow & Co., at Scotstoun, arriving at Barclay Curle's soon after midday. Other shipbuilding yards were visited in the afternoon :—J. Brown & Co., Clydebank, Beardmore & Co., Napier & Miller, and Wm. Denny & Brothers, Dumbarton.

The itinerary of Wednesday, on the south side of the Clyde opened at Weir's engineering works, Cathcart. Thence the Prince proceeded to Dunsmuir & Jackson's, Harland & Wolff's, and the Fairfield Shipbuilding & Engineering Works. Another Govan yard, that of A. Stephen & Son, was inspected on the way to Renfrew, where the establishments of Simons & Co. and Lobnitz & Co., were visited.

NEWS PARAGRAPHS.

Shipbrokers' Association for Newcastle.—At a meeting of shipbrokers held in the Guildhall, Newcastle, it was resolved to form a Shipbrokers' Association for Newcastle. Mr. W. Dodds will act as hon. secretary pro tem., and will give any information to any who desire to become members.

Draughtsmen and Trade Unionism.—A ballot vote of the members of the Newcastle and District branch of the Association of Engineering and Shipbuilding Draughtsmen on the subject of registration under the Trades Union Acts has resulted in 795 favouring the registration and 84 voting against.

Payment for Docking, &c.—Representatives of the Engineering and Shipbuilding Employers' Association and the Ship Constructors and Shipwrights' Association met last week at the offices of the Committee on Production to consider the claim by the latter body for 100 per cent. to be added to their remuneration for docking, undocking and bilge shoring in public and private docks at Cardiff, Penarth and Barry.

Dock Facilities of German American Lines.—According to the *Evening Post* (New York), Mr. Palmer, Custodian of Alien Property, is arranging to take legal possession of the Hamburg-Amerika and North German Lloyd Lines' enormously valuable dock facilities in the port of New York, which will be sold to the highest bidder, preferably Americans. The step has the approval of the President. The value of the docks is estimated at millions of dollars.

Town Line (London), Ltd.—The following circular letter has been issued to the shareholders by the managers (Harrison, Sons & Co., Ltd.): "It has come to our knowledge that certain rumours have been, or are being, circulated with regard to this company which has possibly caused a certain amount of speculation in the shares. We think it only right to advise you, as a shareholder, that the reports we have heard are without foundation. We are not, nor have we been, considering the question of disposing of the steamers, winding up, or amalgamating with other companies."

Wireless Training at Rutherford College.—Further evidence of the success of the Department of Wireless Telegraphy at Rutherford College, Newcastle, which was equipped out of funds provided by local shipowners, is afforded by the results in the second examinations of candidates just held. Twenty-one candidates were presented, and twenty successes were obtained. These candidates commenced their studies in September and October of last year, and had not been previously examined. When the complexity of the subject and the high standard now demanded by the examiners are taken into account, it is indeed creditable to the students and to their tutors that the percentage of successes should have proved so high.

Business Amalgamation.—We have been notified that the businesses of Consulting Engineers and Surveyors, hitherto carried on by W. C. Carter, A.M.I.C.E., M.I.N.A., at 15, Great St. Helens, E.C.3, and by W. C. Carter & Harrison, at 4, Mosley Street, Newcastle-on-Tyne, have been amalgamated, and in future will be conducted under the style of "Carter & Harrison, Ltd.," at the same addresses and under the same management.

Repair of Ships.—At a meeting of the Goole Chamber of Commerce and Shipping last week, representations were made that the Admiralty were ordering Goole-owned ships to other ports for repairs. Strong protest was made against this practice, and it was decided to point out to the Admiralty the benefit to Goole if the work were done locally, and to urge also that owners should be the parties to decide where their own ships should be repaired.

Royal Corps of Naval Constructors.—The status of the Royal Corps of Naval Constructors is being considered by a committee presided over by the Director of Naval Equipment, with a view to the inclusion of the corps in the Royal Navy, with rank similar to engineer officers. Under existing regulations, assistant constructors serve at sea for a year, and during this period only they rank as lieutenants (non-executive), their distinguishing stripe being silver grey. By a recent Admiralty order, carpenter warrant officers are, in future, to be designated warrant shipwrights, and are to wear the silver grey stripe as worn by the Royal Corps of Naval Constructors. This also applies to chief carpenters, carpenter lieutenants and lieutenant-commanders, who will be called commissioned shipwrights, shipwright lieutenants and lieutenant-commanders.

Work of the "Fairfield Emergency Committee."—Sir Alexander Gracie, Chairman of the Fairfield Shipbuilding & Engineering Company, Ltd., has stated that since this Committee was appointed they have distributed assistance to about 1,000 families connected with the works. Of these, 640 were still on their register, and 500 of that number were occupying houses rent free. Up to date, £27,014 had been subscribed by the workers, drawing, tracing and office staffs, and of that amount £26,800 had been spent by the Committee on different schemes for the relief of dependants of soldiers connected with the works. In addition, the Committee had subscribed £2,784 to the Prince of Wales's Fund, £300 to the Sailors' and Soldiers' Families Association, £200 for endowing beds in a local war hospital, £120 to the Lady Pearce Hut at Wimbledon, and £40 to the Scottish Women's Hospitals.

Help for Cardiff Seamen's Hospital.—Sir W. J. Tatem, Bart., at the general meeting of the Royal Hamadryad Seamen's Hospital, Cardiff, stated that advantage had been taken of the recent visit of the Prince of Wales to reopen the Jubilee Fund, which stood at £22,000, with a view to bringing it up to £25,000. They had now received £10,560, and there were several other amounts to follow. The latest subscriptions included £1,050 from Mr. Dan Radcliffe to endow a bed in connection with the visit of Capt. E. R. J. R. Evans, commemorating the gallantry of H.M.S. *Swift* and *Broke*; £1,000 from Sir W. J. Tatem to endow a bed in memory of sailors of the Fleet killed by enemy action; £500 each from Sir William and Lady Seager, Sir Clifford Cory, Mr. W. E. Jones, Mr. L. R. Turnbull, Mr. J. C. Gould (a second donation of a like amount promised). Mr. John More, Sir William Seager, and Sir W. J. Tatem were re-elected chairman, vice-chairman, and president.

Tees Industrial Developments.—Smiths' Dock Company, Ltd., has acquired 74 acres of Tees tidal foreshore from the Tees Conservancy Commission and 7 acres of land from the Kirkleatham estate, making in all 81 acres, for the purpose of constructing an extensive shipyard and marine engine and boiler establishment for the building and equipment of ships of heavy tonnage, and also for the repair of the large steamers which frequent the river Tees. Hitherto the firm has been able to undertake the construction of only comparatively small craft at its south bank establishment. The acquisition of the 81 acres will enable a great extension to Smiths' operations on Tees-side. About 76 acres of the tidal foreshore adjoining that sold to Smith has been acquired by the Tees Furnace Company, Ltd., to be used in connection with the iron works at Lackenby. Thus, the Commission has disposed of all its land on the Yorkshire foreshore. On the Durham side, Bell Bros., Ltd., are said to be in negotiation for a further site.

"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and Type.	Tonnage.	Dimensions. Draught in ( ).	Sold by, to	Builders, hull and year.	Machinery and builders	Remarks.
Balestrand, aux. t.ss. (single dk.)	2,500 gr. 1,900 net	268½′ × 48½′ × 24′	A. Prebensen, Norway, to Overseas Shipping Co., San Francisco	Grays Harbours S.B. Co., Aberdeen, Wash. (1917)	16½ × 22 (Puget Sound Iron & Steel Wks., Tacoma, Wash.)	—
Carston, ss. (spar dk.) (ex *Arthur Balfour,* ex *Frank Coverdale*)	3,849 gr. 2,499 net 6,400 d.w.	340′ × 47′ × 20′ (24′ 4″)	S. Instone & Co., Cardiff, to buyers not stated	R. Stephenson & Co., Newcastle (1903)	24½, 40, 67 × 45 (Richardsons, Westgarth & Co., Middlesbrough)	Price about £88,500.
Centralia, ss. (single dk.)	487 gr. 324 net	160½′ × 36′ × 12½′	Centralia Co., San Francisco, to Pan-American S.S. Co., San Francisco	J. Dickie, Alameda, Cal. (1902)	11, 18½, 32 × 24 (Golden State & Miners Wks., S. Francisco)	—
Cragside, ss. (single dk.)	513 gr. 227 net 600 d.w.	160½′ × 25½′ × 11¼′ (12′ 1″)	L. S. Carr & Co., Newcastle, to Cheviot Coasters, Ltd., Newcastle-on-Tyne	Wood, Skinner & Co., Newcastle (1892)	13, 21½, 34 × 27 (N.E. Mar. Eng. Co., Sunderland)	—
Eblana, ss. ..	808 gr. 366 net 790 d.w.	213′ × 32′ × 15′ (15′ 4″)	Tedcastle, McCormick & Co., Dublin, to buyers not stated	Ardrossan S.B. Co., Ardrossan (1892)	32, 64 × 39 (Hutson & Corbett, Glasgow)	—
Eda, ss. (single dk.)	2,525 gr. 1,627 net 4,330 d.w.	313′ × 44½′ × 20½′ (19′ 9″)	Branksome Chine S.S. Co., Cardiff, to buyers not stated	Richardson, Duck & Co., Stockton (1906)	23, 38, 62½ × 42 (Blair & Co., Stockton)	Price about £75,000.
Eidsiva, ss. (spar dk.) (ex *Vincenzo di Giorgio*)	1,053 gr. 615 net	216′ × 31′ × 20′	Mr. Ad. Halvorsen, Bergen, to buyers not stated	Framnes Mek. Værks., Sandefjord (1907)	18, 29, 48 × 38 (Akers. Mek. Værks., Christiania)	—
Fanestrand, aux. t.ss. (single dk.)	2,350 gr. 1,908 net	261½′ × 48½′ × 23½′	H. Saith, Norway, to Overseas Shipping Co., San Francisco	Aberdeen S.B. Co., Aberdeen, Wash. (1917)	Oil engines (4-cylinder) (Skandia Pacific Oil Eng. Co., San Francisco)	—
Monaleen, ss. (single dk.) (ex *Allerton*)	616 gr. 257 net 820 d.w.	174½′ × 28′ × 10½′ (13′)	J. N. Russell & Sons, Limerick, to buyers not stated	J. Fullerton & Co., Paisley (1914)	14, 24, 40 × 27 (Ross & Duncan, Glasgow)	Price about £41,000. Sold in April, 1916, for about £31,000.

THE CHAMBER OF SHIPPING.

The annual meeting was held in the hall of the Skinners' Company, London, on Wednesday, March 6, Sir William Raeburn, the retiring president, being in the chair.

The President gave a short review of the work of the Chamber during the past year. In this he briefly recounted the matters dealt with in the annual report. The financial position was better than it had ever been, the receipts last year not only covering the expenditure but also the cost of the equipment and furnishing of the new office. The reconstruction of the Chamber was being undertaken and when it received its charter it would embrace all the shipping of the United Kingdom except some of the tonnage, chiefly liner, entered in the Liverpool Association.

Dealing with the Government policy, he said it had often been asked what it was. He thought it was perfectly clear, viz., to go on building standard ships, and nothing but standard ships, with the exception that one vessel in seven should be a larger one than the ordinary standard ship. He was afraid, however, that that arrangement would be interfered with by the exigencies of the times. Whilst agreeing that this policy was the best with regard to the circumstances, he could not help thinking that had shipbuilders been allowed to build to their own designs and to the designs they had been accustomed, these would have been as good and the ships better. As to the future, he hoped the Government would give a statement of its policy in order to lay at rest the uncertainty now prevailing. He did not think there was any need to fear nationalisation. Commenting on the speech of the First Lord of the Admiralty on Tuesday, he said the causes of the delay in output in the shipyards were the Government and labour, and it was not quite fair of the First Lord to suggest that the shipbuilders were to blame unless it was that the spirit had been knocked out of some of them by Government interference. If there was a shipbuilder who was retarding output he would like to hear of him. With the ships that would be coming from America and Canada this year the balance against us would steadily be decreased

Lord Inchcape, the new President, then delivered his presidential address. Any suggestion that State control was better than individual ownership was, he said, a complete fallacy. He detailed the reasons why the tonnage of cargo coming into this country was very little less than before the war. Ships were now better loaded and outlying tonnage from all parts of the world had been brought into service for bringing goods to this country. As to excess profits, very few shipowners would have to pay excess profits taxation for 1918. The losses of shipowners through the sinking of ships were very serious and it would be years before the tonnage could be built up. But we must keep a stout heart and face the future because nothing we could lose was so important as that we should lose the war. As to the complaints of combination for the protection of shipping interests, it was impossible to look to any great industry without finding combinations. At the same time he could say that no arrangement would be made by British shipowners with German shipowners for generations. Tonnage was being sunk at a rate of which the public had no conception and more information should be given. People who had invested money in shipping had a rough time ahead, but he had no fear for the future of the Empire if we all kept our heads and worked to the fullest extent of our capacity.

A number of resolutions were than discussed and passed. Sir John Ellerman, Bart., in dealing with the shipbuilding programme, said that since February, 1917, only 17 steamers of 86,000 tons, with carrying capacity of 130,000 tons, had been built by the Government, whereas private firms had in the same time produced 1,030,000 tons with a carrying capacity of 1½ million tons. We were not constructing new shipping sufficient to meet marine mishaps, leaving out losses by submarines altogether.

FORTHCOMING EVENTS.

INSTITUTION OF ELECTRICAL ENGINEERS (MANCHESTER SECTION).—Tuesday, March 12, meeting at the Engineers' Club, 17, Albert Square, Manchester, at 7 p.m. Paper by Mr. E. B. Wedmore, on "The Control of Large Amounts of Power."

INSTITUTION OF CIVIL ENGINEERS.—Tuesday, March 12, meeting at Great George Street, Westminster, S.W., at 5.30 p.m. Exhibition of cinematograph films illustrating "Water-Power Works in Canada," by Prof. J. C. McLellan, on behalf of Canadian Government.

INSTITUTE OF MARINE ENGINEERS.—Tuesday, March 12, meeting at the Institute, the Minories, Tower Hill, London, E.C., at 6 p.m. Paper by Mr. J. R. Kennedy (Member of Council), on "Boiler and other Repairs by Electric Welding."

INSTITUTE OF METALS.—Wednesday, March 13, at 8 p.m., and Thursday, March 14, at 4 p.m., annual meeting in Rooms of the Chemical Society, Burlington House, Piccadilly, London, W. Presidential address, papers for discussion, and the Fourth Corrosion Report.

INDUSTRIAL RECONSTRUCTION COUNCIL.—Wednesday, March 13, meeting t the Town Hall, Manchester, at 3 p.m., under the auspices of the Lord Mayor, Mr. G. H. Roberts, Minister of Labour, and Sir William McCormick, Department of Scientific Research, will be the principal speakers.

SHIPPING AND OTHER MEETINGS.

Mar. 14 (*Thurs.*)—**Seamen's Hospital Society (Dreadnought)** Greenwich, S.E. (Annual Court), Prince's Restaurant, Piccadilly, W., at 3 p.m.

Mar. 15 (*Fri.*)—**Leeds & Liverpool Canal Co.** (Ordinary Half-yearly), Hotel Metropole, Leeds, at 11 a.m.

SHIPPING SHARE MARKET.

The "return of the Tanks" to London has naturally had an effect upon the amount of new business transacted on the London Stock Exchange, and the market in shipping companies' shares has not been immune from the downward tendency of quotations. It is satisfactory to note, however, that the new campaign on behalf of the National War Bonds is not causing investors to force sales of investments on the market. This is an excellent indication that the investing public recognise that it is new money which is wanted for the bonds, and not a mere exchange from one form of investment of a semi-national character (such as capital in shipping and shipbuilding companies may fairly be described) into another national security. There is every expectation that the £200,000,000 which is asked from London will be obtained without any forced selling of stocks, and if prices have been put down in some instances it may be attributed to the general absence of business or to the desire of dealers to discourage sales during the present week.

It would not be surprising to find a sharp upward movement set in when the campaign is over. Holders of shipping shares should not, however, look for any important appreciation in capital values in their particular section. It is well not to shut one's eyes to the fact that values are sufficiently high in view of the much lower scale of profits now being made by the companies, and in some conservative quarters it is held that the probable rates of dividends for 1918 will not justify some of the existing values. It is a point upon which the individual holder of shipping shares must be left to decide for himself as the conditions of companies vary considerably. Among the shares which have been most active since our last report are Cunards, owing to the forthcoming issue of accounts; Furness Withy; Khedivial Mail, which have advanced to 41s.; Moor Line, which have fallen on the reduction of the dividend; and Sutherland shares which continue to be bought in connection with the developments occurring in that group. In the shipbuilding section there is a strong tone, and reports from the provincial centres show that enquiries are still being made by brokers for shares of which there is a short supply in the market.

SHIPPING, SHIPBUILDING, ENGINEERING AND MARINE INSURANCE SHARE LIST.

SHIPPING.

Name.	Share and paid.	Extreme quotations, 1917.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
African S.S.	20	30½—25½	10	7½	28	
Allan Line ... ... Deb.	100	—	4	4½	92	
Anchor Line ... Cum. pref.	10	9⅞—8⅝	5⅝	5⅝	9¼	
Do. ... ... Deb.	Stk.	105⅜—104⅜	4⅜	4⅛	103	
Argentine Nav. ... Cum. pref.	1	25/—14/3	6	5⅝	23/6	
Do. ... ... Ord.	1	20/6—6/6	Nil.	Nil.	17/-	
Australasian Un. S. Nav. Deb.	Stk.	80⅝—79⅝	4	5	81	
Belfast Steam ... ... "A"	10 (5pd.)	—	5	5	5	
British & Argen. Nav. ... Deb.	Stk.	84—80	4½	5⅝	81	
British India Nav. ... Deb.	Stk.	84—82	4½	5⅝	81½	+ ¾
British S.S. Invest. Trust Def.	Stk.	490—344½	50†	11½	427	
Do. ... ... Pref.	Stk.	105⅛—104	6	5¾	102	
Do. ... ... Deb.	Stk.	74½—70	4½	6⅓	72	
Cairn Line ... ... Deb.	Bds.	94—80	5	5⅝	90⅝—91	
Do. ... ... Ord.	1	51/6—40/9	20†	8	55/6	
Clan Line ... ... Ord.	10	55½—26½	25	5½	49½	— 1½
Court Line ... ... Ord.	£1	40/6—29/6	20	9¼	37/9	— 2/3
Cunard SS. ... ... Ord.	1	85/—63/9	20*	5	87/9	+ -/3
Do. ... Cum. pref.	Stk.	97½—82	5	5½	86½	
Do. ... ... Deb.	Stk.	100—93½	4½	4⅜	97½	
Elder Line ... ... Deb.	Stk.	95—89	4½	4⅜	103	
Elder Dempster ... Cum. pref.	1	19/—17/-	5⅝	6⅛	19/6	
Do. ... ... Deb.	Stk.	89—85	5	5⅞	82½	
Ellerman Lines ... Pref. Ord.	10	9½—8⅝	6⅝	6⅝	9⅞	
Do. ... Guar. pref.	10	9—8⅝	4½	5⅛	8⅞	
France Fenwick ... Cum. pref.	5	95/3—85/-	5*	6⅛	87/6	
Furness, Withy ... ... Ord.	1	60/9—41/6	20*	6⅝	67/6	+ -/9
Do. ... Cum. pref.	10	9—7⅞	5	5⅝	8⅛	+ ⅛
General Steam Nav. ... Ord.	1	24/9—21/6	10	7⅛	28/6	— 4/-
Do. ... ... Pref.	1	19/4½—15/-	5	6⅛	15/3	
Houlder Line ... Cum. pref.	5	82/6—75/-	5*	6⅛	78/9	
Do. ... ... Deb.	Stk.	—	4½	4½	91	
Houlder Bros. ... Cum. pref.	5	—	5*	6⅛	4	
Do. ... ... Deb.	Stk.	—	4½	5⅝	82	
India Gen. Nav. & Rly. ... Ord.	10	11¾—8⅞	6	5⅜	11½	
Indo-China N. ... Pref. Ord.	5	97/6—87/6	6	6⅛	97/6	
Irrawaddy Flotilla	40	—	15	5	120	
Khedivial Mail ... ... Ord.	1	40/—24/-	20	12⅛	39/3	— -/9
Do. ... ... Pref.	5	76/3—70/-	5*	7⅛	72/6	
Do. ... ... Deb.	Stk.	95½—93	4½	4⅞	94½	
King Line ... ... Ord.	1	42/6—31/6	16*	6½	49/10½	+3/1½
Lamport & Holt ... Cum. pref.	£1	20/4½—18/-	6	6	19/-	— ½
Leyland (F.) ... Cum. pref.	10	8⅜—7½	5	5⅜	8⅛	— ⅛
Mercantile SS. ... ... Ord.	5	30½—15	40	8	30½	
Do. ... ... Pref.	1	21/—15/9	5	6⅛	21/-	
Moor Line ... ... Ord.	10	35—20	30	5⅛	55	
Nelson Steam Nav. ...	100	—	5	5⅛	98⅛	
New Zealand ... ... Ord.	£10	—	8	2⅛	32½	
Do. ... ... Deb.	Stk.	87½—86½	4	4⅝	88½	
Nitrate Producers SS. ... Ord.	5	25½—20	30	6½	24½	
Do. ... Cum. pref.	5	100/—90/-	5	5	5	
Oceanic Steam. Nav. ... Deb.	100	98⅛—84	4⅛	4⅛	94xd	
Orient.Stm.Nav.Co. Cum. pref.	10	9⅛—8⅛	5	5⅛	8⅛	
Do. ... ... Deb.	100	92—88	4½	5⅛	88	
P. & O. S. N. ... Cum. pref.	100	93½—84	5	5⅝	91½	
Do. ... ... Def.	100	342—295	18	5⅞	341	
Do. ... ... Deb.	Stk.	65⅛—63⅛	3½	5⅜	64	
Prince Line	1	6⅜—3⅛	30	5⅛	118/-	
R.M.S.P. ... ... Ord.	100	125—109½	7	5⅛	122½	— ½
Do. ... ... Pref.	Stk.	85⅜—80	5	6	85⅛	
Do. ... ... Deb.	Stk.	85—79	4⅛	5⅜	79½	— 5
Shaw, Savill & Alb. Cum. pref.	5	87/6—80/-	5½	6⅛	85/-	
Shell Transport ... ... Ord.	1	6¼—96/3	35	6⅛	5⅜	
Do. ... Cum. pref.	10	9¼—9⅛	5	5⅜	9⅛	
Sutherland SS. Co.	£1	75/—59/9	30	5⅛	107/9	
Union-Castle SS. Cum. pref.	10	7¾—7⅛	4⅛	6	7⅛	+ 1/16
Do. ... ... Deb.	Stk.	90—86	4	4⅝	90	
West Hartlepool ... ... Pref.	10	7⅞—7⅛	5⅛	6⅜	8 1/16	

INSURANCE.

Alliance	20 (2·4 pd.)	10⅛—9	12/-	7	9 1/8	— 3/9
London Assurance	25 (12½ pd.)	60⅜—48½	20	6	62¼	+1½
Merchants' Marine Insurance ...	10 (2½ pd.)	10⅛—6¼	10	6	10⅛	
N. British & Mercantile Ord.	25 (6¼ pd.)	36—29	40/-	6⅛	34½	
Phœnix Assurance	10 (1 pd.)	7⅛—6	40	7	8 1/16	
Royal Exchange Assurance ...	Stk.	241½—187	10	4½	249½	
Sea Insurance	10 (2 pd.)	27½—24½	10	6	27	
World Marine, Limited ...	5 (2 pd.)	6⅛—55/-	5	4½	6	

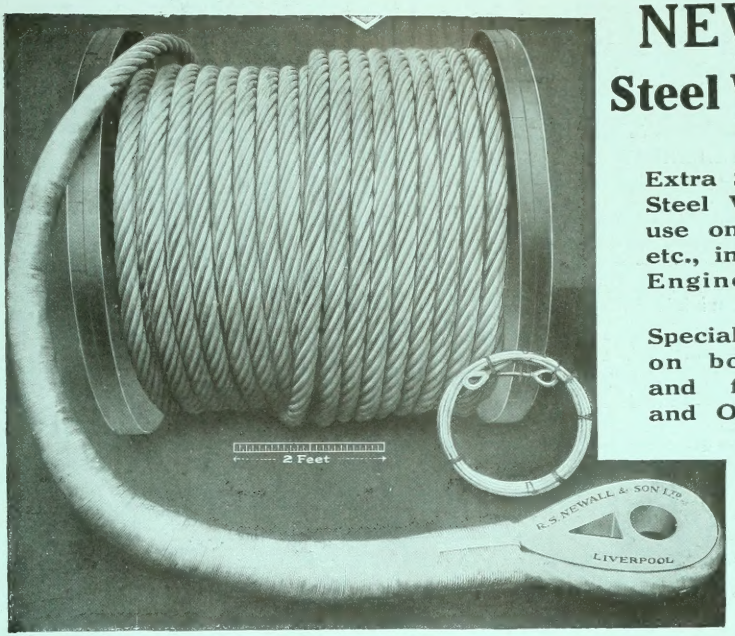
IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1917.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
Babcock & Wilcox... ... Ord.	1	68/—52/6	15	4⅜	68/1½	+2/10½
Baldwins ... Cum. pref.	1	20/—15/-	5⅛	5⅜	20/-	
Do. ... ... Deb.	Stk.	84—82	4½	5⅜	84	
Bayliss, Jones ... Cum. pref.	1	—	5	7½	3 11/16	
Bell Bros. ... ... Cum. pref.	10	10—9⅜	6	6	10	
Do. ... ... Deb.	Stk.	80—73½	5	7	74	
Bessemer (Henry) ... Ord.	1	34/6—24/6	12½	7½	33/6	
Bolckow Vaughan ... Ord.	1	30/—22/2	11	7½	29/6	— -/3
Do. ... ... Cum. pref.	20	17½—16½	5	5⅜	16/9	
Cargo Fleet Iron ... ... Ord.	1	24/9—17/3	3	2⅜	26/4½	— -/1½
Do. ... ... Deb.	100	84—81½	4½	5⅜	82	
Consett Iron Co. ... ... Ord.	1	36/3-24/11½	50	11	90/-	
Dominion Iron & Steel	Bds.	88⅜—71½	5	7	71	
Dorman, Long ... ... Ord.	1	50/—30/9	8†	—	39.3	— -/3
Do. ... ... Deb.	Stk.	—	4	5½	71	
Ebbw Vale Steel & Iron Ord.	1	30/6—24/6	12½	9	28/3	— -/4½
Guest, Keen & Nttefids Ord.	1	89/—62/6	15*	3⅜	87/6	
Do. ... ... Cum. pref.	5	5⅛—5	5	4½	5¼	
Do. ... ... Deb.	Stk.	79½—73½	4	5½	77	
Hadfield's Steel Foundry Ord.	1	107/6—78/6	30	5½	106/6	
Ibbotson Bros.	5 (4 pd.)	7—6¼	7½	4½	6½	
Jessop (W.) & Sons ... Ord.	5 (4 pd.)	10—8	15*	6	10½	
Lanarkshire Steel Cum. pref.	10	—	5	7⅛	7	
Lysaght (J.) ... Cum. pref.	1	25/—20/-	6	6	20/-	
Do. ... ... 2nd pref.	1	19/9—19/4½	6	6	20/-	
Manganese Bronze ... Ord.	1	—	6	11	11½	
Do. ... ... Cum. pref.	1	—	6	8	8	
North-Eastern Steel ... Deb.	Stk.	—	4½	—	—	
Palmers Ship & Iron "A" ...	1	13/—9/9	Nil.	Nil.	13/9	
Scott (Walter) ... ... Ord.	1	29/4½—21/3	15	10⅜	29/-	
Do. ... ... Pref.	1	19/9—16/-	6	7⅛	19/9	
Sheffield Forge ... ... Ord.	1	—	15	4½	67/-	
Shelton Iron & Steel ... Ord.	1	24/6-16/10½	7½	6	22/10½	
Do ... ... Deb.	100	91½—91	5	5½	91½	
S. Durham Steel & Iron Ord.	1	42/9—29/6	10	4¼	42/1½	
Do. ... ... Cum. pref.	1	20/9-18/7½	6	6½	20/-	
Do. ... ... Deb.	Stk.	81—80	4½	5⅝	80	
Steel Co. of Scotland ... Ord.	10	—	10	10	274/3	
Stewarts & Lloyds Pref. ord.	10	17—16	10	6¼	16	
Do. ... ... Cum. pref.	10	—	6	4½	13⅛	
Stone (J.) ... ... Cum. pref.	10	8⅛—7⅛	5	6⅛	7 1/16	— 1/16
United States Steel ... Ord.	100$	124—109⅛	8	7⅛	100 3/16	
Do. ... ... Cum. pref.	100$	—	7	6	114 1/16	
Vickers Ltd. ... ... Ord.	1	44/6—35/3	12½	5⅛	44/3	
Do. ... ... Pref.	Stk.	84—81	5	6	82	
Do. ... ... Deb.	Stk.	79—74½	4	5⅜	76	
Weardale Steel ... Def. ord.	1	32/3—23/-	19½	13½	28/9	
Do. ... ... Cum. pref.	1	25/3—18/9	6	5½	25/-	+ -/6
Do. ... ... Deb.	Stk.	—	4	6½	62	
Workington Iron & Steel Ord.	1	30/3—21/-	10	6⅝	28/6	— -/4½

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth Ord.	1	45/—36/-	12½	5⅝	42/6	— -/3
Do. ... ... Cum. pref.	5	73/9—67/-	4	5⅞	67/6	
Do. ... ... Deb.	Stk.	78—73	5	6⅝	75½	
Beardmore (W.) ... ... Deb.	100	93—89	4½	5	90½	
Brown (John) ... ... Ord.	1 (15s. pd.)	29-/—22/9	12½	7	28/1⅜	
Do. ... ... Cum. pref.	10	8⅛—7⅝	5	5⅛	8⅛	
Cammell Laird ... ... Ord.	5	7⅜—6⅛	10	7⅛	6 13/16	
Do. ... ... Cum. pref.	5	85/6—74/6	5	6⅜	85/-	
Do. ... ... Deb.	100	83⅛—79½	4½	5⅜	84	
Dunlop (Jas.) ... ... Ord.	1	28/9—16/-	10	9½	22/3	— 2/6
Do. ... ... Cum. pref.	1	18/9—16/6	6	7⅛	17/6	
Fairfield Shipbldg Cum. pref.	10	8⅜—8⅛	6	7⅛	8⅛	
Fleming & Ferguson ... Ord.	10	—	10	7	14½	
Gray (Wm.) ... ... Deb.	100	100—95⅜	4½	4⅝	100½	
Hawthorn (R. & W.) Leslie Ord.	10	25⅜—10½	12½	5	28⅛	+ 2⅛
Henderson (D. & W.) Cum. pref.	1	—	5	9	9 1/16	
Richardson Westgarth ... Ord.	1	10/3—5/-	Nil.	Nil.	8/-	— -/3
Do. ... ... Cum. pref.	1	19/9—12/6	Nil.	Nil.	17/6	+ -/6
Do. ... ... Deb.	Stk.	67—62	4½	6⅝	66	
Simons (W.) ... Cum. pref.	10	—	5	5	9 1/16	
Swan, Hunter & W. R. ... Ord.	1	51/—33/6	12½	5⅛	54/3xd	+ 1/3
Do. ... ... Cum. pref.	1	17/3—17/-	5	5⅛	17/-	
Do. ... ... Deb.	Stk.	78—77	4½	5⅞	77	
Thornycroft (John I.) ... Ord.	1	45/—16/-	17½	8⅛	41/6	+ 1/9
Do. ... ... Cum. pref	1	19/—16/-	6	6⅜	18/6	
Do. ... ... Deb.	100	—	5	5⅜	82	
Wallsend Slipway ... Ord.	1	2—1⅛	10	3⅛	65/-	
Do. ... ... Cum. pref.	1	1—1	5	5	1	

* Including bonus. † Also 20 % in shares. ‡ Treasury price.



Best Quality Galvanized Plough Steel Wire Rope, 10½ in. Circ.

NEWALL'S
Steel Wire Ropes

Extra Special Flexible Steel Wire Ropes for use on Giant Cranes, etc., in Shipyards and Engineering Works.

Special Ropes for use on board Warships and for Aeroplanes and Ordnance. :: ::

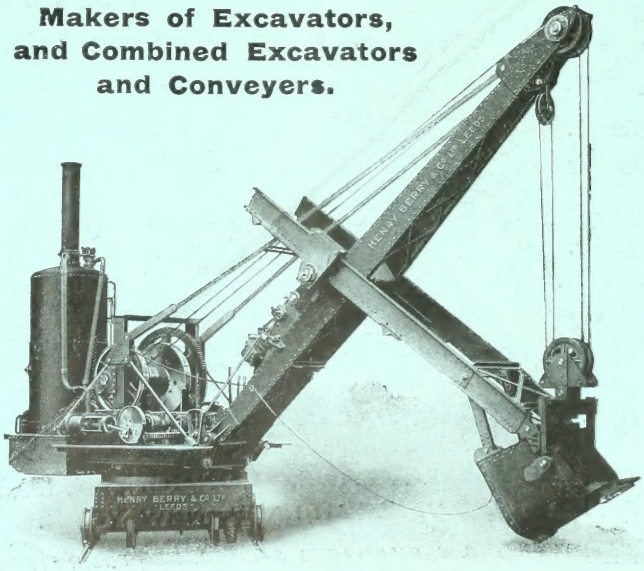
R.S. NEWALL & SON, LTD.

LIVERPOOL
GLASGOW
LONDON

HENRY BERRY & Co., LTD., LEEDS.

Hydraulic Machinery for
RIVETTING
PUNCHING
PRESSING
BENDING
FLANGING
JOGGLING
FORGING
STAMPING
LIFTING
SHEARING.

Makers of Excavators, and Combined Excavators and Conveyers.



STEAM CRANE EXCAVATOR.

BELT, STEAM, AND ELECTRIC-DRIVEN PUMPS.

FIXED AND PORTABLE RIVETTING MACHINES.

ACCUMULATORS.

PUNCHING AND SHEARING MACHINES.

FORGING AND FLANGING PRESSES.

CRANES, LIFTS, VALVES, PIPING, ETC., ETC.

For Emergency Lighting & Wireless.

SELF-STARTING.

The S.O.S. "LISTER-BRUSTON" Automatic Electric Generating Plant is so designed that immediately the voltage of the ship's main electrical supply falls below a predetermined point, the plant automatically starts up.

SELF-TESTING.

This plant automatically starts up and stops at any predetermined time daily, to indicate that it is in working order.

SELF-STOPPING.

Upon the resumption of the main supply the S.O.S. "LISTER-BRUSTON" Automatic Electric Generating Plant automatically stops.

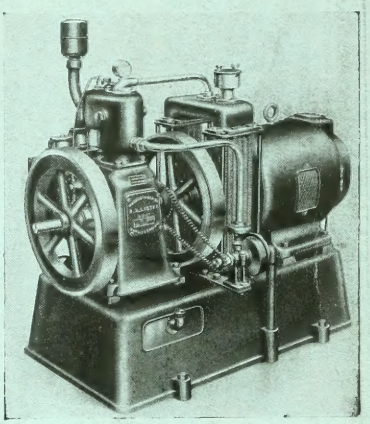
For prices and further particulars apply to—

R. A. LISTER & CO., Ltd.

(Dept. B 24),

47, VICTORIA ST., WESTMINSTER, S.W. 1. DURSLEY, : GLOS. :

Established 1867.



The "Lister-Bruston" (Patent) Automatic Electric Generating Plant, S.O.S. Type.

"ISHERWOOD SYSTEM OF SHIP CONSTRUCTION"

Suitable for ALL TYPES of Vessels.

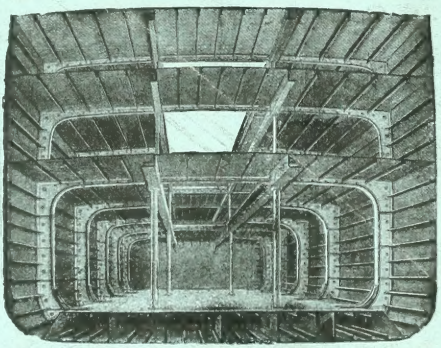
Increased Strength.

Increased Capacity for Bale Goods.

Increased D.W. Carrying Capacity.

Improved Ventilation.

Reduced Cost of Maintenance.



Reduced Vibration.

830 Vessels Built or being Built, representing about 6,250,000 gross reg. tons.

320 Bulk Oil Carriers, representing about 2,890,000 gross reg. tons.

J. W. ISHERWOOD,

4, LLOYD'S AVENUE, LONDON, E.C. 3.

And at 17, BATTERY PLACE, NEW YORK.

Agents for Great Britain: S. C. CHAMBERS & CO., 3, King Street, LIVERPOOL.

London: Printed by Harrison & Sons, Printers in Ordinary to His Majesty, 45, 46, and 47, St. Martin's Lane, London, W.C. 2, and published by Transport (1910) Limited, Proprietors of Shipbuilding and Shipping Record, at Queen Anne's Chambers, Westminster, London, S.W. 1. *March 7, 1918.*